CR 151512

FAILURE MODE AND EFFECT ANALYSIS

AIRLOCK

VOLUME II (Part 2 of 2)

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Mc Donnell Douglas

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COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, latching. "Data 2 Record DCS Control Relay" (K3-317) (52-79703-61) 3.7.3	M	a) Pole F fails open in the reset position.	a) There is a loss of the TR Data (+) SF #3 parameter from the Programmer to the Exp. 2 Rcdr. This results in a loss of recorded subframe 3 data.	a) None	a) Ground observes a loss of recorded subframe 3 data.	a) N/A	----------
		b) Insulating film on contacts due to contamination.	b) There is a temporary loss of recorded subframe 3 data. Ground can perform switching required to restore subframe 3 recording capability.	b) None	b)(1) Ground gives the Tape Recording - Data 2 RECORD command (S330). This will restore the TR Data (+) SF #3 parameter from the Pgmr to the I/B when the crew records Exp 2 (subframe 3) data.	b) IIIb	
This relay is used for recording Data 2 (subframe 4). The relay is controlled by DCS commands (S330 & S331).	L M S	a) Pole F fails open in the latch position.	a) There is a loss of the TR Data (+) SF #4 parameter from the Pgmr to the Exp 2 Rcdr. This results in a loss of recorded subframe 4 data.	a) None	a) Ground observes a loss of recorded Data 2 (subframe 4) data.	a) N/A	----------
		b) Insulating film on contacts due to contamination.	b) There is a loss of recorded Data 2 (subframe 4) data.	b) None	b) None	b) IIIb	
	M	a) Pole E fails open in the reset position.	a) There is a loss of the TR Data (-) SF #3 parameter from the Programmer to the Exp. 2 Rcdr. This results in a loss of recorded subframe 3 data.	a) None	a) Ground observes a loss of recorded subframe 3 data.	a) N/A	----------
		b) Insulating film on contacts due to contamination	b) There is a temporary loss of recorded subframe 3 data. Ground can perform switching required to restore subframe 3 recording capability.	b) None	b)(1) Ground gives the Tape Recording - Data 2 RECORD command (S330). This will restore the TR Data (-) SF #3 parameter from the Pgmr to the I/B when the crew records Exp. 2 (subframe 3) data.	b) IIIb	
	L M S	a) Pole E fails open in the latch position.	a) There is a loss of the TR Data (-) SF #4 parameter from the Pgmr to the Exp. 2 Rcdr. This results in a loss of recorded subframe data.	a) None	a) Ground observes a loss of recorded Data 2 (subframe 4) data.	a) N/A	----------
		b) Insulating film on contacts due to contamination	b) There is a loss of recorded Data 2 (subframe 4) data.	b) None	b) None	b) IIIb	

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Relay, latching, "Data 2 Record DCS Control Relay" (K3-317) (52-79703-61) (Continued)	L M S	a) Pole D fails open in the reset or latch position.	a) None - Pole D is a spare.	a) None	a) None	a) N/A	----------
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole C fails open in the reset position.	a) None - Pole C is not functional in the reset position.	a) None	a) None	a) N/A	----------
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
		a)(1) Pole C fails open in the latch position, or (2) The latch coil fails open.	a) The Tape Recording - Data 2 RECORD command (S330) is not carried through to the Data 2 Control Relays. This results in a loss of recorded Data 2 (subframe 4).	a) None	a)(1) When the Tape Recording - Data 2 RECORD command (S330) is given, the Exp 2 Recorder Tape Motion Monitor (normally K510) indicates there is no tape motion. (2) There is a loss of recorded Data 2 (subframe 4) data.	a) N/A	----------
		b)(1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) Loss of recorded Data 2 (subframe 4) data.	b) None	b) Ground informs crew of observed anomalies. Crew verifies that the Rcdr has not been manually switched OFF.	b) IIIb	
		a)(1) Pole B fails open in the reset position, or (2) Reset coil fails open. (Continued on next page)	a) The Data 2 Control Relays (K3-314 and K3-315) do not cycle to the reset position when the Tape Recording - Data 2 OFF command (S331) is given. This results in continued application of power to the PCM Bus Conv., the Exp Rcdr Conv, the Exp 2 Rcdr, the PCM Pgrm, I/B, L.L. Muxes and H.L. Muxes, the AM Signal Conditioners, the Group 1 and Group 2 Transducers, and the MDA, OWS-1, and OWS-2 Signal Conditioners.	a) If end-of-tape is reached, the Exp 2 Rcdr "STOP" light (located on Panel 204) comes ON.	a) (1) When the Tape Recording - Data 2 OFF command (S331) is given, the Exp 2 Rcdr Tape Motion Monitor channel (normally K510) indicates there still is tape motion. (2) Recorded Data 2 (subframe 4) data is received for time periods beyond when the ground commanded Data 2 OFF (S331).	a) N/A	----------

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Relay, latching, "Data 2 Record DCS Control Relay" (K3-317) (52-79703-61) (Continued)	L M S	b)(1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b)(1) During manned phases, the crew can reset the Data 2 Control Relays. (2) During unmanned phases, there is excessive power consumption. Power cannot be removed from the affected equipment. If operating, time on the Exp 2 Rcdr becomes excessive, the Tape Recorder resupply plan may have to be revised.	b) Crew informs ground of the observed anomaly.	b)(1) Ground requests that the crew manually turn the Data Rcdr OFF. This removes power from the Exp 2 Rcdr. Ground then requests that crew return the "TAPE RECORDING DATA" switch to the "CMD" position.	b) IIIb	
	L M S	a) Pole B fails open in the latch position.	a) None - Pole B is a spare.	a) None	a) None	a) N/A	----------
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	----------
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

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Relay, latching, "Data Record DCS Control Relay" (K3-202) (52-79703-61) 3.7.4	L M S	a) Pole F or Pole E fails open in the reset or latch position.	a) None. These poles are spares.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole D fails open in the reset position.	a) Power is not removed from the MDA, OWS-1 and OWS-2 Signal Conditioners when the Tape Recording - Data OFF command (S377) is given.	a) None	a) None	a) N/A	---
This relay is used in conjunction with DCS Data Recorder commands for recording Prime Data (subframe 1).		b) Insulating film on contacts due to contamination.	b) None, other than excessive power consumption.	b) None	b) None	b) IIIb	
	L M S	a) Pole D fails open in the latch position.	a) Power is not supplied to the MDA, OWS-1 and OWS-2 Signal Conditioners when the Tape Recording - Data RECORD command (S376) is given.	a) None	a) Loss of recorded data from those subframe 1 parameters requiring MDA and OWS Signal Conditioning.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. Loss of this recorded data will not affect mission continuation.	b) None	b)(1) If recorded data from the affected parameters is desired, the ground request that the crew manually record Prime Data (subframe 1). (2) Ground can restore power by commanding Real Time TM ON (11-2) before the Tape Recording - Data RECORD command (S376) is given. After the Data RECORD command (S376) is given, the Real Time TM OFF (11-2) command can be given.	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

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Relay, latching "Data Record DCS Control Relay" (K3-202) (52-79703-61) (Continued)	L M S	a) Pole C fails open in the reset position.	a) When the Tape Recording - Data OFF command (S377) is given, power is not removed from the PCM Bus Conv.	a) None	a) The temperature of the PCM Bus Conv. may be slightly higher than expected after time periods when the Conv. is supposedly powered-down.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None, other than excessive power consumption. Ground or crew can perform switching to remove power from the affected Conv.	b) None.	b)(1) Ground requests that the crew manually control the Data Conv. (2) During unmanned phases, the ground can remove power from the Conv. by commanding all PCM and Recorder functions OFF and then momentarily switch the Bus A and Bus B functions via the PCM Bus Select commands (S274 and S275).	b) IIIb	
	L M S	a) Pole C fails open in the latch position.	a) When the Tape Recording - Data RECORD command (S376) is given, power is not applied to the PCM Bus Conv.	a) None.	a) Loss of recorded Prime Data (subframe 1).	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) Temporary loss of recorded Prime Data (subframe 1). Ground or crew can restore necessary power for recording Prime Data.	b) None.	b)(1) Ground can restore power by using the Data Dump Enable ON command (6-1) or the Real Time TM ON command (11-2) or the Data & Voice Dump Enable ON command (16-2) before the Tape Recording - Data RECORD command (S376) is given. After the Data RECORD command (S376) is given, the other command can be switched OFF. (2) Ground requests that the crew manually control the recording of Prime Data.	b) IIIb	
	L M S	a) Pole B fails open in the reset position. (Continued on next page)	a)(1) With the "TAPE RECORDING DATA" switch in the "CMD" position, if the failure occurs when the Data Rcdr is powered-up, power will continue to be applied to the Data Rcdr whenever the PCM Bus Conv is powered-up.	a)(1) If the end-of-tape is reached on the Data Rcdr, its "STOP" light (located on Panel 204) will come ON.	a)(1) If Data Rcdr is powered-down when failure occurs, recorded Prime Data (subframe 1) is not received when the ground gives the commands for dumping data or data and voice from the data recorder. The Data Rcdr Tape Motion Monitor Channel (normally K508) on R/T TM indicates there is no tape motion.	a) N/A	---

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Relay, latching, "Data Record DCS Control Relay" (K3-202) (52-79703-61) (Continued)	L M S	a) (Cont'd.)	(2) With the "TAPE RECORDING DATA" switch in the "CMD" position, if the failure occurs when the Data Rcdr is powered-down, power is applied to the Data Rcdr only when a Voice Record switch is placed in the "RECORD" position or the ground uses the Tape Recording - Data RECORD command (S376). Data Rcdr power relays will not cycle back to the reset (OFF) position when the RECORD command (DCS or manual) is removed.		(2) If Data Rcdr is powered-up when the failure occurs, data received subsequent to the failure indicates the Data Rcdr is powered-up whenever the PCM Bus Conv. is powered-up.		
		b) Insulating film on contacts due to contamination.	b) Temporary loss of recorded Prime Data (subframe 1). Crew or ground can restore operation of the Data Rcdr or removal of power from the Data Rcdr.	b)(1) Crew informs ground of observed anomaly.	b)(1) Ground can dump data from the Data Rcdr by using the Data RECORD command (S376) along with the normal dump commands. (2) Power can be removed from the Data Rcdr by using the PCM Bus Select commands (S274 & S275) to momentarily switch the Instrumentation Bus A & Bus B functions. (3) Ground can request that the crew manually control the Data Rcdr. This restores normal Data Rcdr Power Relay operation.	b) IIIb	
	L M S	a) Pole B fails open in the latch position.	a) Power is not applied to the Data Rcdr when the ground gives the Tape Recording - Data RECORD command (S376).	a) None.	a)(1) The Data Rcdr Tape Motion Monitor channel (Normally K508) indicates there is no tape motion after ground has given the Tape Recording - Data RECORD command (S376). (2) Ground observes there is missing data when the Data Rcdr is dumped.	a) N/A	---
		(Continued on next page)					

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Relay, latching, "Data Record DCS Control Relay" (KJ-202) (52-79703-61) (Continued)	L M S	b) Insulating film on contacts due to contamination.	b) Temporary loss of recorded Prime Data (subframe 1). Crew or ground can restore power to the Data Rcdr.	b) None	b)(1) Ground can restore power to the Data Rcdr by using the Data Dump Enable ON command (6-1) or the Data and Voice Enable ON command (16-2) prior to giving the Tape Recording - Data RECORD command (S376). The Dump Enable command can be removed after the Data RECORD command is given. (2) Ground can request that the crew manually control the Data Rcdr.	b) IIIb	
		a) Latch coil fails open.	a) There is a loss of DCS capability for recording Prime Data (subframe 1).	a) None	a)(1) When the Tape Recording - Data RECORD command (S376) is given, the Data Rcdr Tape Motion Monitor channel (normally K508) indicates there is no tape motion. (2) Ground observes there is missing data when the Data Rcdr is dumped.	a) N/A	---
		b) Defective wire or terminal due to mechanical or thermal stress.	b)(1) During unmanned phases, there is a loss of recorded Prime Data (subframe 1). (2) During manned phases, the crew can manually control the recording of Prime Data.	b) None	b)(1) Ground requests that the crew manually control the recording of Prime Data.	b) IIIb	
	L M S	a) Reset coil fails open.	a) When the ground gives the Tape Recording - Data OFF command (S377), power is not removed from the PCM Bus Conv., the Data Rcdr, and the MDA, OWS-1 and OWS-2 Signal Conditioners.	a) If the end-of-tape is reached, the Data Rcdr "STOP" light comes ON.	a)(1) Ground observes that the Data Rcdr has continued to record Prime Data after the Tape Recording - Data OFF command (S377) had been given.	a) N/A	---
		b) Defective wire or terminal due to mechanical or thermal stress.	b)(1) During manned phases, the crew can manually control the Data Rcdr. (2) During unmanned phases, the affected equipment will be continuously powered-up. If operating time on the Data Rcdr becomes excessive, the Tape Rcdr resupply plan may have to be revised.	b) Crew informs ground of the anomaly.	b) Ground requests that the crew manually control the Data Rcdr.	b) IIIb	

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Relay, Latching, "Data Record Mode Control Relay #1" (K3-274) (52-79703-61)	M	a) Pole F or Pole A fails open in the reset or latch position.	a) None. Pole F is a spare. Pole A is for GSE only.	a) None	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
3.7.5	M	a) Pole E fails open in the reset position.	a) None. Pole E is not functional in the reset position.	a) None	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
This relay is used in conjunction with the "TAPE RECORDING DATA" switch located on Panel 204.	M	a) Pole E fails open in the latch position.	a) The Data 2 Control Relays K3-314 and K3-315 do not cycle to the latch position if Data 2 (subframe 4) is being recorded when the crew switches the "TAPE RECORDING DATA" switch (on Panel 204) to the "OFF" position. This will be done when Recorders are removed in flight.	a) None	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None. When a Recorder is changed, crew will also switch to manual control of the Recorders to assure that power is not applied to the connector of the Rcdr which is being removed.	b) None	b) None	b) IIIb	

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Relay, Latching, "Data Record Mode Control Relay #1" (K3-274) (52-79703-61) (Continued)	L M S	a) Pole D fails open in the reset position.	a) When Voice Record, Exp 1 Record, Data 2 Record and DCS Back-up R/T TM are all "OFF", power is not removed from the MDA, OWS -1 and OWS-2 Signal Conditioners.	a) None	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None, other than excessive power consumption.	b) None	b) None	b) IIIb	
	M	a) Pole D fails open in the latch position.	a) If the Voice Record, or Exp 1 Record functions are "ON" and the crew switches the "TAPE RECORDING DATA" switch (located on Panel 204) to the "OFF" position, power is not removed from the MDA, OWS -1 and OWS -2 Signal Conditioners	a) None	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None, other than excessive power consumption. Control of the Data Recorder will normally be via the DCS except when a Recorder is being replaced.	b) None	b) None	b) IIIb	- - -
	M	a) Pole D fails open in the latch position.	a) If the "TAPE RECORDING DATA" switch is in the "RECORD" position, power is not supplied to the MDA, OWS -1 and OWS -2 Signal Conditioners	a) None	a) Data is not received from the MDAC, OWS -1 and OWS -2 Signal Conditioners.		
		b) Insulating film on contacts due to contamination.	b) None, except a temporary loss of data. The recording of Data (subframe 1) is normally controlled by the ground.	b) None	b) (1) Ground requests that the crew record voice. This restores power to the MDA, OWS -1 and OWS -2 Signal Conditioners.		

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Relay, Latching, "Data Record Mode Control Relay #1" (K3-274) (52-79703-61) (Continued)	L M S	a) Pole C fails open in the reset position.	a) This is a loss of power to the DCS Cntl Relays (K3-38, -42, -46) for removing power from the PCM Bus Conv.	a) None	a) The PCM Bus Conv. temperature may be slightly higher than expected after periods during which the Conv has supposedly been powered-down.	a) N/A	- - -
		b) Insulating film in contacts due to contamination	b) None, other than excessive power consumption. Ground or crew can perform switching to remove power from the affected Conv.	b) None	b) (1) If deemed necessary for power conservation, the ground can request that the crew manually control the Data Recorder. (2) During unmanned phases, the ground can remove power from the Conv by commanding all PCM and Recorder functions OFF and then momentarily switch the Bus A and Bus B functions via the PCM Bus Select B command, S274.	b) IIIb	
	M	a) Pole C fails open in the latch position when the "TAPE RECORDING DATA" switch is positioned in the "OFF" position.	a) (1) None. This switch is normally placed in the OFF position only when the crew replaces a Tape Recorder. The crew will also place the "TAPE RECORDERS CONTROL" switch in the "MANUAL SELECT" position and position the correct Rcdr rotary switch in the "OFF" position. This assures that +24 VDC power will not be applied to the connector when it is removed from the Rcdr. (2) Ground cannot remove power from the PCM Bus Conv via normal switching.	a) None	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination	b) None. The "TAPE RECORDING DATA" switch is normally in the "CMD" position.	b) None	b) None	b) IIIb	

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Relay, Latching, "Data Record Mode Control Relay #1" (K3-274) (52-79703-61) (Continued)	M	a) Pole C fails open in the latch position when the "TAPE RECORDING DATA" switch is positioned in the "RECORD" position.	a) (1) Power is not supplied to the PCM Bus Conv when ground commands R/T TM ON (11-2) Data & Voice Dump Enable ON (16-2) or Data Dump Enable ON (6-1). (2) If the crew has commanded a function which requires PCM Bus power, there is no effect.	a) None	a) Data is not received when the ground commands any of the following: o R/T TM ON (11-2). o Data & Voice Dump Enable ON (16-2). o Data Dump Enable ON (6-1).	a) N/A	- - -
		b) Insulating film on contacts due to contamination	b) None, except a temporary loss of data. The "TAPE RECORDING DATA " switch is normally in the "CMD" position.	b) None	b) (1) Ground uses the Back-up Real Time TM ON (S268) command for R/T TM. (2) Ground requests that the crew manually dump the required data from the Data Rcdr.	b) IIIb	
	M	a) Pole B fails open in the reset or latch position.	a) None. Redundancy is provided by Pole B on Relay K3-275.	a) None	a) None	a) N/A	
		b) Insulating film on contacts due to contamination	b) None	b) None	b) None	b) IIIb	
	M	a) Latch coil fails open.	a) Loss of power to MDA, OWS -1 and OWS -2 Signal Conditioners when "TAPE RECORDING DATA" switch is switched to the "RECORD" position.	a) None	a) Loss of recorded MDA and OWS subframe 1 data.	a) N/A	
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. Power can be restored by the crew or the ground.	b) None	b) (1) Ground requests that the crew return the "TAPE RECORDING DATA" switch to the "CMD" position, or (2) Ground requests that the crew record voice. This restores the lost power, or (3) Ground requests that the crew restore power by placing an Exp 1 switch in the "RECORD" position.	b) IIIb	

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Relay, Latching "Data Record Mode Control Relay #1" (K3-274) (52-79703-61) (Continued)	M	a) Reset coil fails open.	a) When the "TAPE RECORDING DATA" switch is switched to the "CMD" position, the relay will not cycle to the reset position. This results in a loss of capability of the ground to record Prime Data (subframe 1) via the Tape Recording - Data Record command (S376) due to power not being supplied to the PCM Bus Conv. Also, power is not supplied to the MDA, OWS -1 and OWS -2 Signal Conditioners.	a) None	a) Loss of recorded Prime Data (subframe 1).	a) N/A	- - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. During manned phases the crew can control the Data Recorder. If recorded Prime Data is desired during unmanned phases, ground can restore PCM Bus Conv. power and MDA, OWS -1 and OWS -2 Signal Conditioner power via the Back-up Real Time TM ON command (S268).	b) None	b) (1) Ground requests that the crew manually record Prime Data (subframe 1). (2) During unmanned phases, ground commands Back-up Real Time TM ON (S268) to restore lost power.		
	M	a) Latch coil fails open.	a) When the "TAPE RECORDING DATA" switch is switched to the "OFF" position from the "CMD" position, there is the following effect: o DCS Data 2 Record command (S330) is not locked out. o Power is not removed from the MDA, OWS -1 AND OWS -2 Signal Conditioners when the Exp 1 and Voice switches are positioned in the OFF position. o Power is not supplied to the the PCM Bus Conv if the ground commands R/T TM ON (11-2).	a) None	a) (1) R/T TM is not received when		

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Relay, Latching, "Data Record Mode Control Relay #1" (K3-274) (52-79703-61) (Continued)		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. When a Recorder is changed, crew will also switch to manual control of the Recorders to assure that power is not applied Recorder being changed by a ground command.	b) None	b) (1) Ground uses the Back-up Real Time TM ON command (S268) to obtain R/T TM.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Data Record Mode Control Relay #2" (K3-275) (52-79703-61) 3.7.6	L M S	a) Pole F fails open in the reset position.	a) None - Pole F is not functional in the reset position.	a) None	a) None	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	M	a) Pole F fails open in the latch position.	a) Power is not supplied to the "DATA RECORD" light on Panel 204.	a) The "DATA RECORD" light does not illuminate when the "TAPE RECORDING DATA" switch is switches to the "RECORD" position.	a) None	a) N/A	----
This relay is used in conjunction with the "TAPE RECORDING DATA" switch located on Panel 204.		b) Insulating film on contacts due to contamination.	b) None. "DATA RECORD" light operation is not a requirement for recording subframe 1 data. Also, the ground normally controls the Data Rcdr.	b) (1) Crew switches the "LIGHTING STATUS" switch (located on Panel 207) to the "TEST" position. "DATA RECORD" and "STOP" lights test good. (2) Crew observes that the Data Rcdr "STOP" light (located on Panel 204) is not illuminated and the Data Rcdr sounds and feels like the tape drive motor is running. (3) Crew informs ground of the anomaly.	b) (1) Ground verifies that the Data Rcdr Tape Motion Monitor channel (normally K508) indicates there is tape motion.	b) IIIb	
	L M S	a) Pole E fails open in the reset position.	a) Continuous application of power to the MDA, OWS-1 and OWS-2 Signal Conditioners.	a) None	a) None	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None, other than excessive power consumption.	b) None	b) None	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Data Record Mode Control Relay #2" (K3-275) (52-79703-61) (Continued)	M	a) Pole E fails open in the latch position when the "TAPE RECORDING DATA" switch is in the "OFF" position.	a) When R/T TM on (11-2) is the only function turned-on which required PCM Bus power, there is a loss of power to the MDA, OWS-1 and OWS-2 Signal Conditioners.	a) None	a) There is a loss of data from the MDA, OWS-1 and OWS-2 Signal Conditioners.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Power to the affected Signal Conditioners can be restored.	b) None	b) Ground uses the Back-up Real Time TM ON (S268) command. This restores power to the affected Signal Conditioners.	b) IIIb	
	M	a) Pole D fails open in the latch position when the "TAPE RECORDING DATA " switch is in the "OFF" position.	a) When the ground commands Tape Recording - Data 2 OFF (S331) and Back-up Real Time TM OFF (S269), power is not removed from the PCK Bus Conv (normally Conv #1).	a) None	a) The temperature of the PCM Bus Conv may be slightly higher than expected after time periods when the Conv is supposedly powered-down.	a) N/A.	----
		b) Insulating film on contacts due to contamination.	b) None. Equipment is not damaged by application of power to the Conv. When the "TAPE RECORDING DATA" switch is returned to the "CMD" position, PCM Bus Conv operation will be as planned.	b) None	b) None. Conditions return to normal when the "TAPE RECORDING DATA" switch is returned to the "CMD" position.	b) IIIb	
	M	a) Pole D fails open in the latch position with the "TAPE RECORDING DATA" switch in "RECORD" position.	a) Power is not supplied to the PCM Bus Conv if Tape Recording Data 2 Record (S330) and Back-up Real Time TM ON (S268) are the only other functions turned-on which require PCM Bus power.	a) The "DATA RECORD" light (on Panel 204) does not turn-on.	a) (1) R/T TM data is not received when Back-up Real Time TM ON (S330) command is given. (2) Data 2 is not received when Data 2 Dump is given.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. The "TAPE RECORDING DATA" switch is normally in the "CMD" position.	b) (1) Crew switches the "LIGHTING STATUS" switch to the "TEST" position. The "DATA RECORD" light tests good. (2) Crew informs ground of observed anomaly.	b) Ground informs crew of missing data and requests that the crew switch the "TAPE RECORDING DATA" switch to the "CMD" position as soon as it is convenient.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Data Record Mode Control Relay #2" (K3-275) (52-79703-61) (Continued)	L M S	a) Pole D fails open in the reset position.	a) Power is not removed from the PCM Bus Conv when all functions requiring PCM Bus power are powered-down.	a) None	a) The temperature of the PCM Bus Conv (normally Conv #1) may be slightly higher than expected after time periods when the Conv. has supposedly been powered down.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None, other than excessive power consumption. Ground or crew can perform switching to remove power from the affected Conv.	b) None	b) (1) When all functions requiring Instrumentation System regulated power are powered-down, the ground can momentarily switch the PCM Bus power assignments via the PCM Bus Select commands (S275 & (S274). This removes power from the Converter. (2) Ground requests that the crew switch the "TAPE RECORDING DATA" switch to the "OFF" position. This removes power from the affected Conv.	b) IIIb	
	M	a) Pole C fails open in the reset position.	a) Power is applied to the Data Recorder only when the crew switches one of the Voice Record swtiches to the "RECORD" position. Then power is removed from the Data Rcdr only when the PCM Bus Conv is powered-down.	a) If Data Rcdr reaches the end-of-tape, the Data Rcdr "STOP" light (located on Panel 204) comes ON.	a) (1) TM data indicates the Data Rcdr is operating whenever the PCM Bus Conv is powered-up. (2) Ground requests that the crew manually control the Data Rcdr.	a)	
		b) Insulating film on contacts due to contamination.	b) There is a loss of recorded Prime Data (subframe 1) during unmanned phases. During manned phases, the crew can manually control the Data Recorder.	b) Crew informs ground of observed anomaly.	b) (1) Ground requests that the crew manually control the Data Rcdr. (Power to the Data Rcdr can be removed by placing the "TAPE RECORDING DATA" switch in the "OFF" position.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Data Record Mode Control Relay #2" (K3-275) (52-79703-61) (Continued)	L S	a) Pole C fails open in the reset position.	a) (1) If the Data Rcdr is OFF at the time of failure, power is not supplied to the Rcdr when ground commands Data Record or Data Dump. This results in a loss of recorded Prime Data (subframe 1) (2) If the Data Rcdr is powered-up at the time of failure, power is applied to the Rcdr whenever the PCM Bus is powered-up. Recorded Prime Data is still available.	a) None	a) (1) If Data Rcdr is OFF, there is a loss of recorded Prime Data (subframe 1). The Data Rcdr Tape Motion Monitor channel (normally K508) indicates there is no tape motion when ground attempts to either record or dump Prime Data. (2) If the Data Rcdr is ON, ground observes that the Data Rcdr is operating whenever the PCM Bus is powered-up.	a) N/A	----
		b) Insulating Film on contacts due to contamination.	b) None. Loss of recorded Prime Data does not abort the mission. With crew on board, manual control of the Data Rcdr is possible.	b) None	b) (1) If the Data Rcdr is OFF, ground cannot restore Data Rcdr power. (2) If Data Rcdr is recording or dumping Prime Data, ground can continue to obtain recorded Prime Data.	b) IIIb	
	M	a) Pole B fails open in the reset or latch position.	a) None. Redundancy is provided on Pole B of Relay K3-274.	a) None	a) None	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Data Record Mode Control Relay #2" (k3-275) (52-79703-61) (Continued)	M	a) (1) Latch coil fails open, or (2) Pole C fails open in the latch position.	a) Power is not locked-out from the Data Rcdr when the "TAPE RECORDING DATA" switch is switched from the "CMD" to the "OFF" position.	a) None	a) None	a) N/A	----
		b) (1) Defective wire or terminal due to mechanical or thermal stress. (2) Insulating film on contacts due to contamination.	b) (1) None. When crew replaces the Data Rcdr, the "TAPE RECORDERS CONTROL" switch (located on Panel 204) is placed in the "MANUAL SELECT" position and the "TAPE RECORDERS" switches are placed in the "OFF" position as required to assure that power is not inadvertently applied when the connector is removed from the Rcdr. (2) The Data Rcdr is normally controlled from the ground except for Voice Recording.	b) None	b) None	b) IIIb	
	M	a) (1) Latch coil fails open, or (2) Pole C fails open in the latch position.	a) When the "TAPE RECORDING DATA" switch is switched from the "CMD" to the "RECORD" position, power is not applied to the Data Rcdr.	a) The "DATA RECORD" light (located on Panel 204) does not come ON.	a) Recorded Prime Data (subframe 1) is not received for the time period when the crew was supposed to be recording Prime Data.	a) N/A	----
		b) (1) Defective wire or terminal due to mechanical or thermal stress. (2) Pole C fails open in the latch position.	b) None. The recording of data is normally controlled by the ground. Crew can record Prime Data by using the Voice Record switches.	b) (1) Crew switches the "LIGHTING STATUS" switch to the "TEST" position. The "DATA RECORD" light tests good. (2) Crew switches one of the Voice Record switches to the "RECORD" position. The Voice "RECORD" lights come ON. This indicates that the observed anomaly is not due to Data Rcdr failure. (3) Crew informs ground of the observed anomaly.	b) (1) Ground informs crew that recorded Prime Data has not been received. (2) Ground requests that the crew return the "TAPE RECORDING DATA" switch to the "CMD" position, or that crew record data by using the Voice Record switches.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Data Record Mode Control Relay #2" (k3-275) (52-79703-61) (Continued)	M	a) Reset coil fails open.	a) When the "TAPE RECORDING DATA" switch is switched to the "CMD" position, Relay K3-275 does not cycle to the reset position. This results in a loss of DCS capability to record Prime Data (subframe 1).	a) None	a) (1) Ground observes a loss of recorded Prime Data.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) (1) None. During manned phases, the crew can control the Data Rcdr. (2) During storage, there is a loss of recorded Prime Data. Mission completion is not precluded.	b) None	b) (1) Ground requests that the crew manually control the Data Rcdr.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "Data Record Mode Control Relay #3" (K3-276) (52-79715-13) 3.7.7	M	a) (1) Pole A fails open when the coil is energized, or (2) Coil fails open with Relays K3-274 and K3-275 in the reset position.	a) When the "TAPE RECORDING DATA" switch is switched from the "CMD" to the "OFF" position power is not locked-out from the Data Rcdr.	a) None	a) None	a) N/A	----
		b) (1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) None. When a Recorder is replaced, crew will also switch the "TAPE RECORDERS CONTROL" switch to the "MANUAL SELECT" position as a means of assuring that power is not applied to the Rcdr which is being replaced. The Data Rcdr is normally controlled by the ground.	b) None	b) None	b) IIIb	
This relay is used for controlling Relays K3-274 and K3-275.	M	a) Same as previous failure mode.	a) When the "TAPE RECORDING DATA" switch is switched from the "CMD" to the "RECORD" position, power is not supplied to the Data Rcdr.	a) The "DATA RECORD" light (located on Panel 204) does not come ON.	a) Loss of recorded Prime Data (subframe 1) for the time interval when the crew manually commanded recording of Prime Data.	a) N/A	----
		b) Same as previous failure mode.	b) None. Data is normally recorded by the ground. Crew can record data by using the Voice Record switches.	b) (1) Crew switches the "LIGHTING STATUS" switch to the "TEST" position. The "DATA RECORD" light tests good. (2) Crew switches one of the Voice Record Switches to the "RECORD" position. The Voice "RECORD" lights come ON. This indicates that the observed anomaly is not due to Data Rcdr failure. (3) Crew informs ground of the observed anomaly.	b) (1) Ground informs crew that recorded Prime Data has not been received. (2) Ground requests that the crew return the "TAPE RECORDING DATA" switch to the "CMD" position, or that crew record data by using the Voice Record switches.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "Data Record Mode Control Relay #3" (K3-276) (52-79715-13) (Continued)	M	a) (1) Pole B fails open when the coil is energized, or (2) Coil fails open with Relays K3-274 and K3-275 in the latch position.	a) When the "TAPE RECORDING DATA" switch is switched to the "CMD" position, DCS control of the Data Rcdr is not fully restored. The ground cannot record Prime Data (subframe 1).	a) None	a) (1) There is a loss of recorded Prime Data (subframe 1).	a) N/A	----
		b) (1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) None. Recorded Prime Data is not necessary for mission continuation. During manned phases, the crew can manually control the recording of Prime Data.	b) None	b) Ground requests that the crew manually control the recording of Prime Data.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Data 2 Control Relay #1" (K3-314) (52-79703-61) 3.7.8	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole F or Pole E fails open in the reset position.	a) None. Pole F and Pole E of Relay K3-317 provides redundancy in the reset position.	a) None	a) None	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole F fails open in the latch position.	a) There is a loss of TR Data (+) SF #4 parameter from the Programmer to the Exp 2 Rcdr. This results in a loss of recorded Data 2 (subframe 4) data. R/T Data 2 is not affected.	a) None	a) (1) Loss of recorded Data 2 (subframe 4) data. (2) T/R 3 Tape Motion Monitor channel (K510) indicates Exp 3 Rcdr has tape motion.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Recorded Data 2 (subframe 4) data is not necessary for mission continuation.	b) None	b) Ground informs crew of loss of recorded Data 2.	b) IIIb	
	L M S	a) Pole E fails open in the latch position.	a) There is a loss of TR Data (-) SF #4 parameter from the Exp 2 Rcdr to the Programmer. This results in a loss of recorded Data 2 (subframe 4) data. R/T Data 2 is not affected.	a) None	a) (1) Loss of recorded Data 2 (subframe 4) data. (2) T/R 3 Tape Motion Monitor channel (K510) indicates Exp 3 Rcdr has tape motion.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Recorded Data 2 (subframe 4) data is not necessary for mission continuation.	b) None	b) Ground informs crew of the loss of delayed time Data 2.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Data 2 Control Relay #1" (K3-314) (52-79703-61) (Continued)	L M S	a) Pole C fails open in the reset position.	a) (1) Ground cannot dump the Exp 2 Rcdr.	a) None	a) (1) Data is not received from the Exp 2 Rcdr when the ground dumps the Exp 2 Rcdr. (2) If R/T TM is being received when Exp 2 dump is attempted, the Exp 2 Tape Motion Monitor channel (normally K510) indicates there is no tape motion.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Crew can manually control dumping of Exp 2 Rcdr.	b) None	b) Ground requests that the crew manually dump the Exp 2 Rcdr.	b) IIIb	
	L M S	a) Pole C fails open in the latch position.	a) Power is not applied to the Exp 2 Rcdr for recording Data 2 (subframe 4) data.	a) None	a) (1) Ground observes a loss of recorded Data 2 (subframe 4) data. (2) Recorded subframe 1 data indicates the Exp 2 Rcdr had no tape motion (normally monitored via K510) during the time when Data 2 was supposed to have been recorded.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) There is a loss of recorded subframe 4 data. R/T subframe 4 data is not affected.	b) None	b) None		
	M	a) Pole D fails open in the reset position.	a) There is a loss of power to the "EXP 2 RECORD" light (located on Panel 204). Power to the OWS Exp 2 Record light is not affected.	a) The "EXP 2 RECORD" light (located on Panel 204) does not illuminate when Exp 2 is being recorded. The OWS Exp 2 Record light is illuminated as expected.	a) None	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. This does not affect the recording of Exp 2 data.	b) Crew switches the "LIGHTING STATUS" switch (on Panel 207) to the "TEST" position. "EXP 2 RECORD" light tests good.	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Data 2 Control Relay #1" (K3-314) (52-79703-61) (Continued)	L M S	a) Pole D fails open in the latch position.	a) None. Pole D is not functional in the latch position.	a) None	a) None	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole B fails open in the reset or latch position.	a) None. Redundancy is provided on Pole B of Relay K3-315.	a) None	a) None	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Latch coil fails open.	a) There is a loss of recorded Data 2 (subframe 4). Subframe 4 on R/T TM is not affected.	a) None	a) None	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. Recorded Data 2 (subframe 4) data is not necessary for mission continuation.	b) None	b) Ground informs crew of the loss of recorded Data 2.	b) IIIb	
	L M S	a) Reset coil fails open.	a) (1) There is a loss of power to the "EXP 2 RECORD" light on Panel 204. (2) In CMD mode, power is applied to the Exp 2 Rcdr whenever the Exp Rcdr Conv is powered up.	a) (1) "EXP 2 RECORD" light on Panel 204 does not illuminate when Exp 2 is being recorded. (2) When end-of-tape is reached, the Exp 2 "STOP" light (located on Panel 204) comes ON.	a) Exp 2 Tape Motion Monitor channel (normally K510) indicates there is tape motion during periods when Exp 2 recorder is not being used for dumping or recording data.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. Recorder is not damaged when end-of-tape is reached. Crew can manually configure Tape Recorders and thus remove power from the Exp 2 Rcdr when not needed.	b) (1) Crew checks switches and circuit breakers for associated equipment which could cause the observed anomaly. (2) Crew informs crew of the anomaly.	b) Ground requests that the crew manual configure the Tape Recorders.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Data 2 Control Relay #2" (K3-315) (52-79703-53) 3.7.9	M	a) Pole F fails open in the reset position.	a) There is a loss of power to the Exp 2 Record lights in the OWS. Power to the AM "EXP 2 RECORD" (located on Panel 204) is not affected.	a) The OWS Exp 2 Record Lights do not illuminate when Exp 2 data is being recorded. The AM "EXP 2 RECROD" light (located on Panel 204) is illuminated as expected.	a) None	a) N/A	----
		b) Insultaing film on contacts due to contamination.	b) None. Recording of Exp 2 data is not affected.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew informs ground of the anomaly.	b) None	b) IIIb	
	L M S	a) Pole F fails open in the latch position.	a) None. Pole F is not functional in the latch position.	a) None	a) None	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole E fails open in the reset position.	a) When the recording of Data 2 (subframe 4) data is commanded OFF, power is not removed from the following equipment: o MDA Signal Conditioner. o OWS-1 and OWS-2 Signal Conditioners.	a) None	a) None	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None, other than excessive power consumption.	b) None	b) None	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	----
		b) Insulating Film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Data 2 Control Relay #2" (K3-315) (52-79703-53) (Continued)	L M S	a) Pole E fails open in the latch position.	a) (1) If no record functions other than Data 2 (subframe 4) are being performed, there is a loss of power to the MDA and OWS-1 and -2 Signal Conditioners. This results in a loss of data from these signal conditioners. (2) If any other data is being recorded concurrent with the recording of Data 2, power to the MDA and OWS-1 and -2 Signal Conditioners is not affected.	a) None	a) Loss of data from the MDA and OWS-1 and -2 Signal Conditioners.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None, other than a temporary loss of recorded Data 2 (subframe 4) data.	b) None	b) (1) When ground commands the recording on Data 2 (subframe 4) data, they also record Prime Data (subframe 1). This restores power to the affected signal conditioners.	b) IIIb	
	L M S	a) Pole D fails open in the reset position.	a) Power is not removed from the Exp Rcdr Bus Conv (normally Conv #2) when all commands requiring Exp Rcdr Bus power are OFF.	a) None	a) The Exp Bus Voltage Monitors (normally M520, M521 and M522) indivate continuous application of power to the Exp Rcdr Bus Conv.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None, other than excessive power consumption.	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Data 2 Control Relay #2" (k3-315) (52-79703-53) (Continued)	L M S	a) Pole D fails open in the latch position.	a) (1) When recording Data 2 (subframe 4) is the only Exp Bus function which is ON, power is not supplied to the Exp Bus Conv. This results in a loss of power to the Exp 2 Rcdr for recording Data 2 data. (2) If Exp 1 is being recorded, power for recording Data 2 is not affected.	a) None	a) (1) There is a loss of recorded Data 2 (subframe 4) data. (2) The Exp Bus Voltage Monitors (normally M520, M521 and M522) indicate loss of Exp Bus (normally Bus B) power. (3) The [illegible] Tape Motion Monitor [illegible] K510) indicates [illegible] motion.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) Temporary loss of recorded Data 2 (subframe 4) data. Crew or ground can perform required switching to restore power.	b) None	b) (1) Ground [illegible]s that the crew pl[illegible] [illegible]P 1" switch in thw [illegible] position. This restor[illegible] power to the Exp Bus Conv. When switch is returned to the "OFF" position, power is not removed from the Exp Bus Conv until Data 2 record command is removed, or (2) Ground can restore power to Exp Bus Conv via the Exp 2/ Data 2 Dump Enable ON command. These commands are not followed up with the respective Dump Execute ON command, thus the Exp 2 Rcdr is not dumped. This is merely a means of restoring power to the Exp Rcdr Conv.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Data 2 Control Relay #2" (K3-315) (52-79703-53) (Continued)	L M S	a) Pole C fails open in the latch position.	a) When the recording of Data 2 (sbuframe 4) data is the only PCM function which is ON, there is a loss of power to the PCM Bus Conv (normally Conv #1). This results in a loss of power to the PCM Programmer and Interface.	a) None	a) Ground observes a loss of recorded Data 2 (subframe 4).	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) Temporary loss of recorded Data 2 (subframe 4) data. Crew or ground can perform required switching to restore power. NOTE: It is not likely that Tape Recording - Data 2 Record will be the only PCM function which is ON. If most any other PCM function is ON, the effects of this failure are eliminated.	b) None	b) (1) Ground can restore power to the PCM Bus Conv via the Exp 2/Data Dump Enable ON command or the Exp 1 & Exp. Voice Dump Enable ON command. These commands are not followed up with the respective Dump Execute ON command, or (2) Ground requests that the crew place the "EXP 1" switch in the "RECORD" position. This restores power to the PCM Bus Conv. When switch is returned to the "OFF" position, power is not removed from the PCM Bus Conv until Data 2 record command is removed.	b) IIIb	
	L M S	a) Pole B fails open in the reset or latch position.	a) None. Redundancy is provided by Pole B of Relay K3-314.	a) None	a) None	a) N/a	----
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Data 2 Control Relay #2" (K3-315) (52-79703-53) (Continued)	L M S	a) Pole C fails open in the reset position.	a) Power is not removed from the PCM Bus Conv when all functions requiring PCM Bux power are OFF.	a) None	a) The temperature of the PCM Bus Conv (nromally Conv #1) may be slightly higher than expected after periods when the Conv has supposedly been powered-down.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None, other than excessive power consumption. The equipment is not damaged by the continuous application of power.	b) None	b) None	b) IIIb	
	L M S	a) Reset coil fails open.	a) (1) When the ground commands Tape Recording - Data 2 OFF, power is not removed from the following equipment: o OWS-1 and -2 Signal Conditioners. o MDA Signal Conditioner. o PCM Bus and Exp Rcdr Bus Converters. (2) Power is not supplied to the OWS Exp 2 "RECORD" lights when crew is recording Exp 2 data.	a) The OWS Exp 2 "RECORD" lights do not illuminate when Exp 2 data is being recorded. The AM Exp 2 "RECORD" light (located on Panel 204) illuminates as expected.	a) (1) Temperature of Converters may be slightly higher than expected after periods when the Convs have supposedly been powered-down. (2) The Exp Rcdr Bus Voltage Monitors (normally M520, M521 and M522) indicate that the Exp Rcdr Bus is continuously powered-up.	a)	
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None, other than excessive power consumption.	b) None	b) (1) Ground requests that crew OPEN the Exp Rcdr Bus Conv (normally Conv #2) circuit breaker during periods when Exp Rcdr Bus power is not needed.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Data 2 Control Relay #2" (K3-315) (52-79703-53) (Continued)	L	a) Latch coil fails open.	a) When the ground commands Tape Recording - Data 2 Record, power is not supplied to the following equipment if other PCM/Record functions are OFF: o MDA and CWS-1 and -2 Signal Conditioners. o PCM and Exp Rcdr Converters.	a) None	a) Loss of recorded Data 2 (subframe 4) data. R/T subframe 4 is not affected.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None, except a temporary loss of Data 2 (subframe 4) data. Crew or ground can perform switching required to restore lost power. NOTE: If Exp 1 data is being recorded, the effects of this failure are eliminated.	b) None	b) (1) Ground can restore power by the Exp 1 & Exp Voice Dump Enable ON or Exp 2/Data 2 Dump Enable ON command. These commands are not followed up with the respective Execute ON command, or (2) Ground requests that the crew place the "EXP 1" switch in the "RECORD" position. This restores lost power.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "Data 2 Control Relay #3" (K3-316) (52-79715-13) 3.7.10	L M S	a) (1) Pole A fails open when coil is energized, or (2) The coil fails open with Relays K3-314 and K3-315 in the reset position.	a) Relays K3-314 and K3-315 cannot be cycled to the latch position. This results in a loss of recorded Data 2 (subframe 4) data. R/T subframe 4 data is not affected.	a) None	a) (1) There is a loss of recorded Data 2 (subframe 4) data. (2) The Exp 2 Tape Motion Monitor channel (K510) indicates there was no tape motion during the time period when Data 2 was being recorded.	a) N/A	- - -
		b) (1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) None. Recorded Data 2 (subframe 4) data is not essential for mission completion.	b) None	b) None	b) IIIb	
		a) (1) Pole B fails open when coil is energized, or (2) The coil fails open with Relays K3-314 and K3-315 in the latch position.	a) (1) Power is not removed from the following equipment when the Exp 2/Data 2 Record and Dump commands are OFF: o PCM Bus Conv. o PCM Programmer and Interface Box. o Sensors using Bus A or Bus B power. o Instrumentation System Packages 2A and 2B. o Exp Rcdr Conv. o Exp 2 Rcdr. (2) The recording of Exp 2 data is not affected.	a) (1) When the crew records Exp 2 data, the AM and OWS Exp 2 "RECORD" lights do not illuminate. (2) When the Exp 2 Rcdr reaches the end-of-tape, the Exp 2 Rcdr "STOP" light (located on Panel 204) comes ON.	a) (1) The Exp Rcdr Bus Voltage Monitor channels (normally M520, M521 and M522) indicate the Exp Rcdr Conv is powered-up 100% of the time. (2) When the Exp 2/Data 2 Record and Dump commands are OFF, the Exp 2 Rcdr Tape Motion Monitor (normally K510) indicates there is tape motion. (3) Temperature of the PCM Bus and Exp Rcdr Converter may be slightly higher than expected after periods when the Converters are supposedly powered-down.	a) N/A	- - -

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "Data 2 Control Relay #3" (K3-316) (52-79715-13) (Continued)		b) (1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) There is excessive power consumption. Power to the Exp 2 Rcdr can be removed by manual switching. If necessary, power to the Converters can be removed by opening the Conv circuit breakers.	b) (1) Crew switches the "LIGHTING STATJS" switch (located on Panel 207) to the "TEST" position. The Exp 2 "RECORD" light tests good. (2) Crew informs ground of the observed anomaly.	b) Ground requests that the crew manually configure the Tape Rcdrs so that power can be removed from the Exp 2 Rcdr without opening the Exp Rcdr Conv circuit breaker.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Switch, Momentary, "TAPE RECORDING EXP 1" (52-79705-113) 3.7.11	M	a) Contact set 2,3 (or 5,6) fails open in the "RECORD" position.	a) Relay K3-268 (or Relay K3-269) does not cycle to the latch position.	a) None	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination	b) None. Redundancy is provided by contact set 5,6 (or 2,3) and Relay K3-269 (or Relay K3-268).	b) None	b) None	b) IIIb	
This switch is located on Panel 204 and is used for recording Exp 1 data (subframe 2) from the Airlock Module.	M	a) Contact set 2,1 (or 5,4) fails open in the "OFF" position.	a) When the AM "EXP 1" switch is switched to the "OFF" position, Relay K3-268 (or Relay K3-269) does not reset. Power is not removed from the following equipment: o PCM Bus and Exp Rcdr Converters. o Exp 1 Rcdr. o PCM Pgmr, I/B, H.L. Multiplexers and L. L. Multiplexers. o MDA, OWS -1 and OWS -2 Signal Conditioners. o Group 1 and Group 2 Transducers. o Instrumentation System Signal Conditioners.	a) (1) The AM and OWS "EXP 1 RECORD" lights do not extinguish when the "EXP 1" switch is switched to the "OFF" position. (2) If the Exp 1 Rcdr reaches the end-of-tape, its "STOP" light (on Panel 204) comes ON.	a) (1) The Exp 1 Rcdr Tape Motion Monitor channel (normally K509) indicates there is tape motion. (2) The Exp Rcdr Bus voltage monitor channels (normally M520, M521 and M522) indicate that the Exp Rcdr Conv is powered-up.		

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Switch, Momentary, "TAPE RECORDING EXP 1" (52-79705-113) (Continued)		b) Insulating film on contacts due to contamination	b) (1) There is excessive power consumption. Power to the two Converters and the MDA/OWS Signal Conditioners can be removed by opening their circuit breakers. (2) Power to the Exp 1 Rcdr can be removed by manual control of the Rcdr data assignments. (3) During storage, the circuit breaker to one of the Converters can be opened to remove power. The other Conv will be continuously powered up and the third Conv will be in active stand-by.	b) (1) Crew recycles the "EXP 1" switch. "EXP 1 RECORD" lights still do not extinguish. (2) Crew switches the OWS Exp 1 Record switch to the "OFF" position. "EXP 1 RECORD" lights still do not extinguish. (3) Crew informs ground of the anomsly.	b) (1) Ground verifies that the Exp 1 Rcdr is still running. (2) Ground requests that the crew manually control the Rcdr data assignments and thus turn the Exp 1 Rcdr OFF. (3) Ground requests that the crew control the record and dump functions of the Exp Rcdrs and OPEN the Exp Rcdr Conv circuit breaker when Exp Rcdr Conv power is not needed. (4) Ground informs crew of what switching is needed prior to storage periods.	b) IIIb	
Switch, Momentary, "TAPE RECORDING EXP 2" (52-79705-113) 3.7.12	M	a) Contact set 2,3 (or 5,6) fails open in the "RECORD" position.	a) Relay K3-270 (or Relay K3-271) does not cycle to the latch position.	a) None	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination	b) None. Redundancy is provided by contact set 5,6 (or 2,3) and Relay K3-271 (or Relay K270).	b) None	b) None	b) IIIb	
This switch is located on Panel 204 and is used for recording Exp 2 data (subframe 3) from the Airlock Module.		a) Contact set 2,1 (or 5,4) fails open in the "OFF" position.	a) (1) When the AM "EXP 2" switch is switched to the "OFF" position, Relay K3-270 (or Relay K3-271) does not reset. Power is not removed from the following equipment: o PCM Bus and Exp Rcdr Convs o EXP 2 Rcdr o PCM Pgmr, I/B, H.L. Multiplexers and L. L. Multiplexers. o Group 1 and Group 2 Transducers. o Instrumentation System Signal Conditioners o Data 2 (subframe 4) cannot be recorded.	a) (1) The AM and OWS "EXP 2 RECORD" lights do not extinguish when the "EXP 2" switch is switched to the "OFF" position. (2) If the Exp 2 Rcdr reaches the end-of-tape, its "STOP" light (on Panel 204) comes ON.	a) (1) The Exp 2 Rcdr Tape Motion Monitor channel (normally K510) indicates there is tape motion. (2) The Exp Rcdr Bus voltage monitor channels (normally M520, M521 and M522) indicate that the Exp Rcdr Conv is powered-up. (3) Ground observes a loss of recorded Data 2 (subframe 4).	a) N/A	- - -

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Switch, Momentary, "TAPE RECORDING EXP 2" (52-79705-113) (Continued)		b) Insulating film on contacts due to contemination	b) (1) There is excessive power consumption. Power to the two Converters can be removed by opening their circuit breakers. (2) Power to the Exp 2 Rcdr can be removed by manual control of the Rcdr data assignments. (3) During storage, the circuit breaker to one of the Converters can be opened to remove power. The other Conv will be continuously powered up and the third Conv will be in inactive stand-by.	b) (1) Crew recycles the "EXP 2" switch. "EXP 2 RECORD" lights still do not extinguish. (2) Crew switches the OWS Exp 2 Record switch to the "OFF" position. "EXP 2 RECORD" lights still do not extinguish. (3) Crew informs ground of the anomaly.	b) (1) Ground verifies that the Exp 2 Rcdr is still running. (2) Ground requests that the crew manually control the Rcdr data assignments and thus turn the Exp 2 Rcdr OFF. (3) Ground requests that the crew control the record and dump functions of the Exp Rcdrs and OPEN the Exp Rcdr Conv circuit breaker when Exp Rcdr Conv power is not needed. (4) Ground informs crew of what switching is needed prior to storage periods.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "AM Exp 2 Record Relay #1" (K3-270) (52-79703-53) 3.7.13 or Relay, Latching "OWS Exp 2 Record Relay #1" (K3-266) (52-79703-53) 3.7.19 These relays are used in the recording of Exp 2 data from the AM and OWS Exp 2 switches, respectively.	L M S	a) Pole F fails open in the reset position.	a) (1) If Pole F of Relay K3-266 fails open when the Exp 2 Recorder is OFF, the Exp 2 Recorder can only be powered-up by switching the OWS Exp 2 switch to the "RECORD" position. (2) If Pole F of Relay K3-270 fails open when the Exp 2 Recorder is OFF, the Exp 2 Recorder can only be powered up by switching an AM or OWS Exp 2 switch to the "RECORD" position. (3) Once the Exp 2 Recorder is powered-up, the Exp 2 Recorder power relays do not cycle to the OFF (reset) position when the Recorder is turned OFF by normal means. This results in power being supplied to the Exp 2 Recorder whenever the Exp Recorder Conv is powered-up.	a) (1) If the end-of-tape is reached, the Exp 2 Recorder "STOP" light (on Panel 204) comes ON. (2) If Pole F of K3-266 has failed open, when ground switches AM "Exp 2" switch to the "RECORD" position, the Exp 2 "RECORD" light does not come on.	a) (1) If the Exp 2 Recorder is powered-down, when the Tape Recording--Data 2 RECORD command (S330) is given, the Exp 2 Recorder tape motion monitor channel (normally K510) indicates there is no tape motion. (2) If the Exp 2 Recorder is powered-down, when the ground dumps the Exp 2 Recorder, data is not received. The Exp 2 Recorder tape motion monitor channel (normally K510) indicates there is no tape motion. (3) If the Exp 2 Recorder is powered-up at the time of failure, ground informs the crew that the Exp 2 Recorder is powered-up whenever the Exp Recorder Conv is powered-up.	a) N/A	- - -
		b) **Insulating film on contacts due to contamination.**	b) (1) There is a loss of recorded Data 2 (subframe 4) data. (2) Crew and ground cooperating together can control the recording and dumping of subframe 3 data. Exp Recorder Conv power can be removed from the Exp 2 Recorder by the crew or ground.	b) **(1) Crew informs ground of anomaly and coordinates with ground to determine cause of failure.** (2) Crew can manually remove power from the Exp 2 Recorder by using the "TAPE RECORDERS" switches (located on Panel 204). (3) Crew can dump the Exp 2 Recorder only if they first switch one of the "Exp 2" switches to the "RECORD" position. (4) Crew switches the "LIGHTING STATUS" switch to the "TEST" position. The AM Exp 2 "RECORD" light tests good.	b) (1) Ground coordinates with crew in troubleshooting. (2) Ground cannot restore recorded Data 2. (3) Ground can dump the Exp 2 Recorder only if the crew first switches an AM or OWS "Exp 2" switch to the "RECORD" position. (4) Ground can remove power from the Exp 2 Recorder by momentarily switching the PCM Bus Select functions (S274 and S275).	b) **IIIb**	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "AM Exp 2 Record Relay #1" (K3-270) (52-79703-53) or Relay, Latching, "OWS Exp 2 Record Relay #1" (K3-266) (52-79703-53) (Continued)	M	a) Pole F fails open in the latch position.	a) (1) Relay K3-270: Power is not supplied to the latch coil of the Exp 2 Recorder power relays when the AM "Exp 2" switch is switched to the "RECORD" position. Power is not supplied to the Exp 2 Recorder. (2) Relay K3-266: Power is not supplied to the latch coil of the Exp 2 Recorder power relays when the OWS "Exp 2" switch is switched to the "RECORD" position. Power is not supplied to the Exp 2 Recorder.	a) (1) The AM and OWS Exp 2 "RECORD" lights do not come ON.	a) (1) The Exp 2 Recorder tape motion monitor channels (normally K510) indicate there is no tape motion. The Exp Recorder Bus voltage monitors (normally M520, M521 and M522) indicate zero voltage. (2) There is a loss of recorded Exp 1 data.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None, other than a loss of some recorded Exp 2 data.	b) (1) Crew switches the "LIGHTING STATUS" switch to the "TEST" position. The AM "RECORD" lights (on Panel 204) test good. (2) Crew switches the affected Exp 2 switch "OFF" and then switches the other Exp 2 switch to the "RECORD" position. The Exp 2 "RECORD" lights come ON.	b) (1) Ground requests that the crew try the other Exp 2 RECORD switch.	b) IIIb	
	M	a) Pole E fails open in the latch position.	a) None. Redundancy is provided by Pole E of Relay K3-271 or (Relay K3-267).	a) None.	a) None.	a) N/A	- - -
		b) Insulating film on contacts due to contamination	b) None.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "AM Exp 2 Record Relay #1" (K3-270) (52-79703-53) or Relay, Latching, "OWS Exp 2 Record Relay #1" (K3-266) (52-79703-53) (Continued)	L M S	a) Pole D fails open in the reset position.	a) (1) If the Exp Recorder Conv is powered-down, power is not applied to the Conv when the ground gives the Exp 1 and Exp Voice Dump Enable ON (10-2) or Exp 2/Data 2 Dump Enable ON (12-2) command. Power is applied for other commands requiring Exp Recorder Conv power. (2) If the failure occurs when the Exp Recorder Conv is powered-up for an Exp 1 or Exp 2 Recorder dump or the recording of Exp 1 or Exp 2 data, power is not removed from the Exp Recorder Conv when these functions are turned OFF.	a) None.	a) (1) Data is not received when either or both of the dump commands is given. The tape motion monitor channels indicate there is no tape motion and the Exp Bus voltage monitor channels (normally M520, M521 and M522) indicate the Exp Bus voltages are zero. (2) The Exp Bus voltage monitor channels indicate the Exp Bus is powered-up even though the Exp Recorders are powered-down.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) Ground can perform switching to overcome the failure.	b) (1) Upon direction from the ground, crew can manually control the Instrumentation System.	b) (1) If Tape Recording - Data 2 "RECORD" command (S330) is given, necessary power is restored for the Exp Recorder(s) data dump. If both Exp Recorders are to be dumped, the dump enable command for one of them should be removed prior to the S330 command. This is necessary to prevent possible Conv overload. (2) Power can be removed from the Exp Recorder Conv by commanding all Instrumentation System functions OFF and then using the PCM Bus Select commands (S274 and S275) to momentarily switch Bus A and Bus B assignments.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "AM Exp 2 Record Relay #1" (K3-270) (52-79703-53) or Relay, Latching, "OWS Exp 2 Record Relay #1" (K3-266) (52-79703-53) (Continued)	L M S	a) Pole E fails open in the reset position.	a) There is a loss of recorded Data 2 (subframe 4). R/T subframe 4 is not affected.	a) None.	a) (1) When the Tape Recording - Data 2 RECORD command (S330) is given, the Exp 2 Recorder tape motion monitor channel (normally K510) indicates no tape motion. (2) Loss of recorded Data 2.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) There is a loss of recorded Data 2 for the remainder of the mission.	b) None.	b) (1) Ground informs crew of the anomaly and directs crew as to proper on-board trouble shooting. Recorded Data 2 is not restored.	b) IIIb	
		a) Pole D or Pole C or Pole B fails open in the latch position.	a) None. Redundancy is provided by Poles D, C and B respectively on Relay K3-271 (or Relay K3-267).	a) None.	a) None.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
		a) Pole B fails open in the reset position.	a) None. Pole B is not functional in the reset position.	a) None.	a) None.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
		a) Pole A fails open in the reset or latch position.	a) None. GSE use only.	a) None.	a) None.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "AM Exp 2 Record Relay #1" (K3-270) (52-79703-53) or Relay, Latching, "OWS Exp 2 Record Relay #1" (K3-266) (52-79703-53) (Continued)	L M S	a) Pole C fails open in the reset position.	a) (1) If the PCM Bus Conv is powered-down, power is not applied to the PCM Bus Conv when any of the following DCS commands are given: o Real Time TM ON (11-2). o Data & Voice Dump Enable ON (16-2). o Data Dump Enable ON (6-1). Power is applied for other DCS or manual commands requiring PCM Bus power. (2) If the failure occurs when the PCM Bus Conv is powered-up for one or more of the following functions, power is not removed from the Conv when the functions are all commanded OFF: o DCS Real Time TM. o DCS Data Recorder Dump. o Exp 1 or Exp 2 Record. o Voice Record. o Data Record.	a) None.	a) (1) Data is not received when the DCS commands listed in the FAILURE EFFECTS column are given. (2) The temperature of the PCM Bus Conv may be slightly higher than expected after it has supposedly been powered-down.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) Ground can perform switching to overcome the failures.	b) None.	b) (1) Ground gives the Back-up Real Time TM ON (S268) command. Real Time TM is received. Data is received from the Data Recorder. (2) Ground can remove power from the PCM Bus Conv by commanding all Instrumentation System functions OFF and then momentarily switch the PCM Bus Select function (S274 and S275).	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "AM Exp 2 Record Relay #1" (K3-270) (52-79703-53) or Relay, Latching, "OWS Exp 2 Record Relay #1" (K3-266) (52-79703-53) (Continued)	M	a) Latch coil fails open.	a) None. Redundancy of provided by Relay K3-271 (or Relay K3-267).	a) None.	a) None.	a) N/A	- - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None.	b) None.	b) None.	b) IIIb	
	M	a) Reset coil fails open.	a) (1) There is a loss of recorded Data 2 (subframe 4). R/T subframe 4 is not affected. (2) Power is not removed from the PCM Bus Conv and the Exp Recorder Bus Conv when the AM or OWS Exp 2 switch is switched to the "OFF" position. Power is continuously applied to the following equipment: o PCM Pgmr, I/B, H.L.Multiplexers and L.L.Multiplexers. o Group 1 and Group 2 Transducers. o Instrumentation System Signal Conditioners. o Exp 2 Recorder.	a) (1) When the AM or OWS Exp 2 switch is switched to the "OFF" position, the AM and OWS Exp 2 "RECORD" lights do not extinguish. If the end-of-tape is reached, the Exp 2 Recorder "STOP" light (on Panel 204) comes ON.	a) (1) R/T [illegible] indicates that the Exp Recorder Bus is continuously powered-up. (2) R/T [illegible] and recorded Data (subframe 1) indicate that the Exp 2 Recorder has tape motion after power has supposedly been removed from the Recorder. (3) There is a loss of recorded Data 2 (subframe 4).	a) N/A	- - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) (1) There is a loss of recorded Data 2 (subframe 4). (2) Power cannot be removed from the PCM Bus Conv and the Exp Recorder Conv except by opening their circuit breakers. This results in excessive power consumption. The crew can remove power from the Exp 2 Recorder by using the "TAPE RECORDERS" switches on Panel 204.	b) Crew informs ground of the anomaly.	b) (1) Ground requests that the crew manually control the Recorders so that power can be removed from the Exp 2 Recorder. (2) Crew requests that the ground open the Exp Recorder Conv circuit breaker when the Exp Recorders are not being used.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching "AM Exp 2 Record Relay #2" (K3-271) (52-79703-53) 3.7.14 or Relay, Latching, "OWS Exp 2 Record Relay #2" (K3-267) (52-79703-53) 3.7.20 These relays are used in the recording of Exp 2 data from the AM & OWS Exp 2 switches respectively.	L M S	a) Pole F fails open in the reset position.	a) (1) If Pole F of Relay K3-267 fails open when the Exp 2 Rcdr is OFF, the Exp 2 Rcdr can only be powered-up by switching the OWS Exp 2 switch to the "RECORD" position. (2) If Pole F of Relay K3-271 fails open when the Exp 2 Rcdr is OFF, the Exp 2 Rcdr can only be powered-up by switching an AM or OWS Exp 2 switch to the "RECORD" position. (3) Once the Exp 2 Rcdr is powered-up, the Exp 2 Rcdr power relays do not cycle to the OFF (reset) position when the Rcdr is turned OFF by normal means. This results in power being supplied to the Exp 2 Rcdr whenever the Exp, Rcdr Conv is powered-up.	a) (1) If the end-of-tape is reached, the Exp 2 Rcdr "STOP" light (on Panel 204) comes ON. (2) If Pole F of K3-267 has failed open, when ground switches AM "EXP 2" switch to the "RECORD" position, the Exp 2 "RECORD" light does not come ON.	a) (1) If the Exp 2 Rcdr is powered-down, when the Tape Recording - Data 2 RECORD command (s330) is given, the Exp 2 Rcdr tape motion monitor channel (normally K510) indicates there is no tape motion. (2) If the Exp 2 Rcdr is powered-down, when the ground switches the Exp 2 Rcdr, data is not received. The Exp 2 Rcdr tape motion monitor channel (normally K510) indicates there is no tape motion. (3) If the Exp 2 Rcdr is powered-up at the time of failure, ground informs the crew that the Exp 2 Rcdr is powered-up whenever the Exp Rcdr Conv is powered-up.	a) N/A	- - -
		b) Insulating film on contacts due to contamination	b) (1) There is a loss of recorded Data 2 (subframe 4) data. (2) Crew and ground cooperating together can control the recording and dumping of subframe 3 data. Exp Rcdr Conv power can be removed from the Exp 2 Rcdr, by the crew or ground.	b) (1) Crew informs ground of anomaly and coordinates with ground to determine cause of failure. (2) Crew can manually remove power from the Exp 2 Rcdr by using the "TAPE RECORDERS" switches (located on Panel 204). (3) Crew can dump the Exp 2 Rcdr only if they first switch one of the "EXP 2" switches to the "RECORD" position. (4) Crew switches the "LIGHTING STATUS" switch to the "TEST" position. The AM Exp 1 "RECORD" light tests good.	b) (1) Ground coordinates with crew in troubleshooting. (2) Ground cannot restore recorded Data 2. (3) Ground can dump the Exp 2 Rcdr only if the crew first switches an "EXP 2" switch to the "RECORD" position. (4) Ground can remove power from the Exp 2 Rcdr by momentarily switching the PCM Bus Select functions (S274 & S275).	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching "AM Exp 2 Record Relay #2" (K3-271) (52-79703-53) or	M	a) Pole E fails open in the latch position.	a) None - Redundancy is provided by Pole E of Relay K3-270 (or Relay K3-266).	a) None	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination	b) None	b) None	b) None	b) IIIb	
Relay, Latching "OWS Exp 2 Record Relay #2" (K3-267) (52-79703-53) (Continued)	L M S	a) Pole D fails open in the reset position.	a) (1) If the Exp Rcdr Conv is powered-down, power is not applied to the Conv when the ground gives the Tape Recording - Data 2 RECORD (S330) command, or if the crew manually configures the TM Transmitters for an Exp 1, Exp Voice or Exp 2 data dump. Note - During a normal mission, the crew does not transmit tape recorder data. (2) If the failure occurs when the Exp Rcdr Conv is powered-up for the recording of Exp 1 or Exp 2 data or of Data 2 (subframe 4) data, or for the dumping of Exp 1, Exp Voice or Exp 2 where the crew has manually configured the TM transmitter assignments, power is not removed from the Exp Rcdr Conv when these functions are turned OFF. Power is removed from the Rcdr(s).	a) None	a) (1) When the Tape Recording - Data 2 RECORD command (S330) is given, the Exp 2 Rcdr tape motion monitor channel (normally K510) indicates there is no tape motion and the Exp Rcdr Bus voltage monitors (normally M520, M521 and M522) indicate zero volts. Data from the Exp 1 and/or Exp 2 Rcdrs is not received if the crew manually configures the TM Transmitters. TM indicates Exp Rcdr Bus voltage is zero. (2) The Exp Rcdr Bus voltage monitors (normally M520, M521 and M522) indicate Bus is powered-up even though the Exp Rcdrs are not being used.	a) N/A	- - -
		b) Insulating film on contacts due to contamination	b) (1) There is a loss of recorded Data 2 (subframe 4) during unmanned phases. (2) TM Transmitter configuration is normally DCS controlled.	b) Upon direction from the ground, the crew manually configures the Tape Recorder data assignments with the intended Exp 1 Rcdr switch in the "OFF" position and then switches an Exp 1 switch to the "RECORD" position to obtain power for ground capability to record Data 2 (subframe 4).	b) (1) Ground requests that the crew return the TM Transmitter configuration to DCS control. (2) Ground can remove power from the Exp Rcdr Conv if the Instrumentation System functions are OFF by momentarily switching the PCM Bus Select functions (S274 and S275).	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "AM Exp 2 Record Relay #2" (K3-271) (52-79703-53)	M	a) Pole F fails open in the latch position.	a) None - Redundancy is provided by Pole F of Relay K3-270 (or K3-266).	a) None	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination	b) None	b) None	b) None	b) IIIb	
or							
Relay, Latching "OWS Exp 2 Record Relay #2" (K3-267) (52-79703-53) (Continued)	L M S	a) Pole E fails open in the reset position.	a) There is a loss of recorded Data 2 (subframe 4). R/T subframe 4 is not affected.	a) None	a) (1) When the Tape Recording Data 2 RECORD command (8330) is given, the Exp 2 Rcdr tape motion monitor channel (normally K510) indicates no tape motions (2) Loss of recorded Data 2.	a) N/A	- - -
		b) Insulating film on contacts due to contamination	b) There is a loss of recorded Data 2 for the remainder of the mission.	b) None	b) (1) Ground informs crew of the anomaly and directs crew as to proper on-board trouble shooting. Recorder Data 2 is not restored.	b) IIIb	
		a) Pole D or Pole C or Pole B fails open in the latch position.	a) None - Redundancy is provided by Poles D, C and B respectively on Relay K3-270 (or Relay K3-266).	a) None	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination	b) None	b) None	b) None	b) IIIb	
		a) Pole B fails open in the reset position.	a) None - Pole B is not functional in the reset position.	a) None	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination	b) None	b) None	b) None	b) IIIb	
		a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "AM Exp 2 Record Relay #2" (K3-271) (52-79703-53) or Relay, Latching, "OWS Exp 2 Record Relay #2" (K3-267) (52-79705-53) (Continued)	L M S	a) Pole C fails open in the reset position.	a) (1) If the PCM Bus Conv is powered-down, power is not applied to the PCM Bus Conv when the ground gives the Tape Recording - Data 2 RECORD command (S330) or the Back-up R/T TM ON command (S268) or the crew manually configures the TM Transmitters for a R/T TM, Data or Voice transmission. Also, power is not supplied to the PCM Bus Conv when crew switches the "DATA" switch (on Panel 204) to the "RECORD" position. (2) If the failure occurs when the PCM Bus Conv is powered-up for one or more of the following functions, power is not removed from the Conv when the function are all commanded OFF: o DCS Back-up R/T TM. o DCS Data 2 RECORD. o Manual configuration of TM Transmitters for R/T TM, Data or Voice transmission. o Manual Data Record. o Exp 1 or Exp 2 Record. o Voice Record.	a) The "DATA RECORD" light (on Panel 204) does not come ON when the "DATA" switch (on Panel 204) is switched to the "RECORD" position.	a) (1) There is a loss of recorded Data 2 (subframe 4) data. (2) R/T, Data and/or Voice is not received when the crew manually configures the TM Transmitters. (3) The temperature of the PCM Bus Conv may be slightly higher than expected after periods of time when the Conv has supposedly been powered-down.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None. Configuration of the TM Transmitters is normally controlled by DCS. Power to the PCM Bus Conv can be restored.	b) Upon direction from the ground the crew switches an Exp 1 or Exp 2 switch to the "RECORD" position to supply power to the PCM Bus Conv.	b) (1) Ground requests that the crew return TM Transmitter configuration to DCS control. (2) Ground uses R/T TM ON command (11-2) to obtain R/T TM data. (3) Ground can remove power from the PCM Bus Conv by commanding all Instr. System functions OFF and then momentarily switch the PCM Bus function (S274 & S275).	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "AM Exp 2 Record Relay #2" (K3-271) (52-79703-53) or Relay, Latching, "OWS Exp 2 Record Relay #2" (K3-267) (Continued)					b) (4) Ground Can restore PCM Bus power with Tape Recording Data RECORD command (S376) or R/T TM ON command (11-2). Power for Data 2 recording may be obtained in this manner.		
	M	a) Latch coil fails open.	a) None - Redundancy of provided by Relay K3-270 (or Relay K3-266).	a) None	a) None	a) N/A	- - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None	b) None	b) None	b) IIIb	
	M	a) Reset coil fails open.	a) (1) There is a loss of recorded Data 2 (subframe 4). R/T subframe 4 is not affected. (2) Power is not removed from the PCM Bus Conv and the Exp Rcdr Bus Conv when the AM or OWS "EXP 2" switch is switched to the "OFF" position. Power is continuously supplied to the following equipment: o PCM Pgmr, I/B, H.L. Multiplexers and L.L. Multiplexers. o Group 1 and Group 2 Transducers. o Instrumentation System Signal Conditioners. o Exp 2 Rcdr.	a) (1) When the AM or OWS "EXP 2" switch is switched to the "OFF" position, the AM & OWS Exp 2 "RECORD" lights do not extinguish. If the end-of-tape is reached, the Exp 2 Rcdr "STOP" light (on Panel 204) comes ON.	a) (1) R/T TM indicates that the Exp Rcdr Bus is continuously powered-up. (2) R/T TM and recorded Data (subframe 1) indicate that the Exp 2 Rcdr has tape motion after power has supposedly been removed from the Rcdr. (3) There is a loss of recorded Data 2 (subframe 4).	a) N/A	- - -

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "AM Exp 2 Record Relay #2" (K3-271) (52-79703-53) or Relay, Latching, "OWS Exp 2 Record Relay #2" (K3-267) (Continued)		b) Defective wire or terminal due to mechanical or thermal stress..	b) (1) There is a loss of recorded Data 2 (subframe 4). (2) Power cannot be removed from the PCM Bus Conv and the Exp Rcdr Conv except by opening their circuit breakers. This results in excessive power consumption. The crew can remove power from the Exp 2 Rcdr by using the "TAPE RECORDERS" switches on Panel 204.	b) Crew informs ground of the anomaly.	b) (1) Ground requests that the crew manually control the Rcdrs so that power can be removed from the Exp 2 Rcdr. (2) Crew requests that the ground open the Exp Rcdr Conv circuit breaker when the Exp Rcdrs are not being used.		

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "AM Exp. 1 Record Relay #1" (K3-268) (52-79703-53) 3.7.15 or Relay, Latching, "OWS Exp 1 Record Relay #1" (K3-264) (52-79703-53) 3.7.17 These relays are used in the recording of Exp 1 data from the AM and OWS Exp 1 switches, respectively.	L M S	a) Pole F fails open in the reset position	a)(1) If Pole F of Relay K3-264 fails open when the Exp 1 Rcdr is OFF, the Exp 1 Rcdr can only be powered-up by switching the OWS Exp 1 switch to the "RECORD" position. (2) If Pole F of Relay K3-265 fails open when the Exp 1 Rcdr is OFF, the Exp 1 Rcdr can only be powered-up by switching an AM or OWS Exp 1 switch to the "RECORD" position. (3) Once the Exp 1 Rcdr is powered-up, the Exp 1 Rcdr power relays do not cycle to the OFF (reset) position when the Rcdr is turned OFF by normal means. This results in power being supplied to the Exp 1 Rcdr whenever the Exp Rcdr Conv is powered-up.	a)(1) If the end-of-tape is reached, the Exp 1 Rcdr "STOP" light (on Panel 204) comes ON. (2) If Pole F of K3-264 has failed open, when ground switches AM "EXP 1" switch to the "RECORD" position, the Exp 1 "RECORD" light does not come ON.	a)(1) If the Exp 1 Rcdr is powered-down, when the ground dumps the Exp 1 Rcdr, data is not received. The Exp 1 Rcdr tape motion monitor channel (normally K509) indicates there is no tape motion. (2) If the Exp 1 Rcdr is powered-up at the time of failure, ground informs the crew that the Exp 1 Rcdr is powered-up whenever the Exp Rcdr Conv is powered-up.	a) N/A	---
		b) Insulating film on contacts due to contamination	b)(1) Crew and ground cooperating together can control the recording and dumping of Exp 1 data & Exp Voice. Exp Rcdr Conv power can be removed from the Exp 1 Rcdr by the crew or ground.	b)(1) Crew informs ground of anomaly and coordinates with ground to determine cause of failure. (2) Crew can manually remove power from the Exp 1 Rcdr by using the "TAPE RECORDERS" switches (located on Panel 204). (3) Crew can dump the Exp 1 Rcdr only if they first switch one of the "EXP 1" switches to the "RECORD" position. (4) Crew switches "LIGHTING STATUS" switch to the "TEST" position. The AM Exp 1 "RECORD" light tests good.	b)(1) Ground coordinates with crew in troubleshooting. (2) Ground can dump the Exp 1 Rcdr only if the crew first switches an "EXP 1" switch to the "RECORD" position. (3) Ground can remove power from the Exp 1 Rcdr by momentarily switching the PCM Bus Select functions (S274 & S275).	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "AM Exp 1 Record Relay #1" (K3-268) (52-79703-53) or Relay, Latching, "OWS Exp 1 Record Relay #1" (K3-264) (52-79703-53) (Continued)	M	a) Pole F fails open in the latch position	a)(1) Relay K3-268: Power is not supplied to the latch coil of the Exp 1 Rcdr power relays when the AM "EXP 1" switch is switched to the "RECORD" position. Power is not supplied to the Exp 1 Rcdr. (2) Relay K3-264: Power is not supplied to the latch coil of the Exp 1 Rcdr power relays when the OWS "EXP 1" switch is switched to the "RECORD" position. Power is not supplied to the Exp 1 Rcdr.	a)(1) The AM and OWS Exp 1 "RECORD" lights do not come on.	a)(1) The Exp 1 Rcdr tape motion monitor channels (normally K509) indicate there is no tape motion. The Exp Rcdr Bus voltage monitors (normally M520, M521 & M522) indicate zero voltage. (2) There is a loss of recorded Exp 1 data.	a) N/A	---
		b) Insulating film on contacts due to contamination	b)(1) None, other than a loss of some recorded Exp 1 data.	b)(1) Crew switches the "LIGHTING STATUS" switch to the "TEST" position. The AM "RECORD" lights (on Panel 204) test good. (2) Crew switches the affected Exp 1 switch "OFF" and then switches the other Exp 1 switch to the "RECORD" position. The Exp 1 "RECORD" lights come ON.	b)(1) Ground requests that the crew try the other Exp 1 Record switch.	b) IIIb	
	M	a) Pole E or Pole D or Pole C or Pole B fails open in the latch position	a) None - Redundancy is provided by Relay K3-269 (or Relay K3-265).	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "AM Exp 1 Record Relay #1" (K3-268) (52-79703-53) or Relay, Latching, "OWS Exp 1 Record Relay #1" (K3-264) (52-79703-53) (Continued)	L M S	a) Pole E fails open in the reset position	a) If the Exp Rcdr Conv is powered-up for voice recording or Exp 1 recording or R/T TM ON command (11-2) or Tape Recording - Data RECORD command (S376) or manually commanded "DATA RECORD," power is not removed from the MDA, OWS-1 and OWS-2 Signal Conditioners when all of these functions are turned OFF.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination	b) None, other than excessive power consumption.	b) None	b) None	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position	a) None - GSE use only.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole B fails open in the reset position	a) None - Pole B is not functional in the reset position.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "AM Exp 1 Record Relay #1" (K3-268) (52-79703-53) or Relay, Latching, "OWS Exp 1 Record Relay #1" (K3-264) (52-79703-53) (Continued)	L M S	a) Pole D fails open in the reset position	a)(1) If the Exp Rcdr Conv is powered-down, power is not applied to the Conv when the ground gives the Exp 1 & Exp Voice Dump Enable ON (10-2) or Exp 2/Data 2 Dump Enable ON (12-2) command. Power is applied for other commands requiring Exp Rcdr Conv power. (2) If the failure occurs when the Exp Rcdr Conv is powered-up for an Exp 1 or Exp 2 Rcdr dump or the recording of Exp 1 or Exp 2 data, power is not removed from the Exp Rcdr Conv when these functions are turned OFF.	a) None	a)(1) Data is not received when either or both of the dump commands is given. The tape motion monitor channels indicate there is no tape motion and the Exp Bus voltage monitor channels (multiplexed M520, M521 & M522) indicate the Exp Bus voltages are zero. (2) The Exp Bus voltage monitor channels indicate the Exp Bus is powered-up even though the Exp Rcdrs are powered-down.	a) N/A	---
		b) Insulating film on contacts due to contamination	b)(1) Ground can perform switching to overcome the failure.	b)(1) Upon direction from the ground, crew can manually control the Instrumentation System.	b)(1) If Tape Recording - Data 2 "RECORD" command (S330) is given, necessary power is restored for the Exp Rcdr(s) data dump. If both Exp Rcdr(s) are to be dumped, the dump enable command for one of them should be removed prior to the S330 command. This is necessary to prevent possible Conv overload. (2) Ground can remove power from the Exp Rcdr Conv if the Instrumentation System functions are OFF by momentarily switching the PCM Bus Select functions (S274 & S275).	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "AM Exp 1 Record Relay #1" (K3-268) (52-79703-53) or Relay, Latching, "OWS Exp 1 Record Relay #1" (K3-264) (52-79703-53) (Continued)	L M S	a) Pole C fails open in the reset position	a)(1) If the PCM Bus Conv is powered-down, power is not applied to the PCM Bus Conv when any of the following DCS commands are given: o Real Time TM ON (11-2). o Data & Voice Dump Enable ON (16-2). o Data Dump Enable ON (6-1). Power is applied for other DCS or manual commands requiring PCM Bus power. (2) If the failure occurs when the PCM Bus Conv is powered-up for one or more of the following functions, power is not removed from the Conv when all of the functions are all commanded OFF: o DCS Real Time TM. o DCS Data Redr dump. o Exp 1 or Exp 2 Record. o Voice Record. o Data Record.	a) None	a)(1) Data is not received when the DCS commands listed in the FAILURE EFFECTS column are given. (2) The temperature of the PCM Bus Conv may be slightly higher than expected after it has supposedly been powered-down.	a) N/A	---
		b) Insulating film on contacts due to contamination	b) Ground can perform switching to overcome the failures.	b) None	b)(1) Ground gives the Back-up Real Time TM ON (S268) command. Real Time TM is received. Data is received from the Data Redr. (2) Ground can remove power from the PCM Bus Conv by commanding all Instr. System functions OFF and then momentarily switching the PCM Bus Select functions (S274 & S275).	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "AM Exp 1 Record Relay #1" (K3-268) (52-79703-53)	M	a) Latch coil fails open	a) None - Redundancy of provided by Relay K3-269 (or Relay K3-265).	a) None	a) None	a) N/A	---
		b) Defective wire or terminal due to mechanical or thermal stress	b) None	b) None	b) None	b) IIIb	
or							
Relay, Latching, "OWS Exp 1 Record Relay #1" (K3-264) (52-79703-53) (Continued)	M	a) Reset coil fails open	a)(1) Power is not removed from the PCM Bus Conv and the Exp Rcdr Bus Conv when the AM (or OWS) "EXP 1" switch is switched to the "OFF" position. Power is continuously applied to the following equipment: o PCM Pgmr, I/B, H.L. Multiplexers and L.L. Multiplexers. o Group 1 and Group 2 Transducers. o Instrumentation System Signal Conditioners. o Exp 2 Rcdr. o MDA & OWS-1 & -2 Signal Conditioners.	a)(1) When the AM (or OWS) "EXP 1" switch is switched to the "OFF" position, the AM & OWS Exp 1 "RECORD" lights do not extinguish. If the end-of-tape is reached, the Exp 1 Rcdr "STOP" light (on Panel 204) comes ON.	a)(1) R/T TM indicates that the Exp Rcdr Bus is continuously powered-up. (2) R/T TM and recorded data (subframe 1) indicate that the Exp 1 Rcdr has tape motion after power has supposedly been removed from the Rcdr.	a) N/A	---
		b) Defective wire or terminal due to mechanical or thermal stress	b)(1) Power cannot be removed from the PCM Bus Conv and the Exp Rcdr Conv except by opening their circuit breakers. This results in excessive power consumption. The crew can remove power from the Exp 2 Rcdr by using the "TAPE RECORDERS" switches on Panel 204.	b) Crew informs ground of the anomaly.	b)(1) Ground requests that the crew manually control the Rcdrs so that power can be removed from the Exp 1 Rcdr. (2) Ground requests that the crew open the Exp Rcdr Conv circuit breaker when the Exp Rcdrs are not being used.	b) IIIb	

*COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "AM Exp 1 Record Relay #2" (K3-269) (52-79703-53) 3.7.16 or Relay, Latching, "OWS Exp 1 Record Relay #2" (K3-265) (52-79703-53) 3.7.18 These relays are used in the recording of Exp 1 data from the AM and OWS Exp 1 switches, respectively.	L M S	a) Pole F fails open in the reset position.	a) (1) If Pole F of Relay K3-265 fails open when the Exp 1 Recorder is OFF, the Exp 1 Recorder can only be powered-up by switching the OWS Exp 1 switch to the "RECORD" position. (2) If Pole F of Relay K3-269 fails open when the Exp 1 Recorder is OFF, the Exp 1 Recorder can only be powered-up by switching an AM or OWS Exp 1 switch to the "RECORD" position. (3) Once the Exp 1 Recorder is powered-up, the Exp 1 Recorder power relays do not cycle to the OFF (reset) position when the Recorder is turned OFF by normal means. This results in power being supplied to the Exp 1 Recorder whenever the Exp Recorder Conv is powered-up.	a) (1) If the end-of-tape is reached, the Exp 2 Recorder "STOP" light (on Panel 204) comes ON. (2) If Pole F of K3-265 has failed open, when ground switches AM "Exp 1" switch to the "RECORD" position, the Exp 1 "RECORD" light does not come ON.	a) (1) If the Exp 1 Recorder is powered-down, when the ground dumps the Exp 1 Recorder, data is not received. The Exp 1 Recorder tape motion monitor channel (normally K509) indicates there is no tape motion. (2) If the Exp 1 Recorder is powered-up at the time of failure, ground informs the crew that the Exp 1 Recorder is powered-up whenever the Exp Recorder Conv is powered-up.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) (1) Crew and ground cooperating together can control the recording and dumping of Exp 1 data and Exp Voice. Exp Recorder Conv power can be removed from the Exp 1 Recorder by the crew or ground.	b) (1) Crew informs ground of anomaly and coordinates with ground to determine cause of failure. (2) Crew can manually remove power from the Exp 1 Recorder by using the "TAPE RECORDERS" switches (located on Panel 204). (3) Crew can dump the Exp 2 Recorder only if they first switch one of the "Exp 1" switches to the "RECORD" position. (4) Crew switches the "LIGHTING STATUS" switch to the "TEST" position. The AM Exp 1 "RECORD" light tests good.	b) (1) Ground coordinates with crew in troubleshooting. (2) Ground can dump the Exp 1 Recorder only if the crew first switches an "Exp 1" switch to the "RECORD" position. (3) Ground can remove power from the Exp 1 Recorder by momentarily switching the PCM Bus Select functions (S274 and S275) when the Exp Recorders are commanded OFF.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "AM Exp 1 Record Relay #2" (K3-269) (52-79703-53) or Relay, Latching, "OWS Exp 1 Record Relay #2" (K3-265) (52-79703-53) (Continued)	M	a) Pole F or Pole E or Pole D or Pole C or Pole B fails open in the latch position.	a) None. Redundancy is provided by Relay K3-268 (or Relay K3-264).	a) None.	a) None.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole E fails open in the reset position.	a) If the Exp Recorder Conv is powered-up for voice recording or Exp 1 recording or Back-up R/T TM ON command (268) or Tape Recording - Data 2 RECORD (8330), power is not removed from the MDA, OWS-1 and OWS-2 Signal Conditioners when all of these functions are turned OFF.	a) None.	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None, other than excessive power consumption.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None. GSE use only.	a) None.	a) None.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole B fails open in the reset position.	a) None. Pole B is not functional in the reset position.	a) None.	a) None.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "AM Exp 1 Record Relay #2" (K3-269) (52-79703-53) or Relay, Latching, "OWS Exp 1 Record Relay #2" (K3-265) (52-79703-53) (Continued)	L M S	a) Pole D fails open in the reset position.	a) (1) If the Exp Recorder Conv is powered-down, power is not applied to the Conv when the ground gives the Tape Recording - Data 2 RECORD command (S330) or the crew manually configures the TM Transmitters for an Exp 1, Exp Voice, or Exp 2 dump. (2) If the failure occurs when the Exp Recorder Conv is powered-up for recording Data 2 or Exp 1 or Exp 2, or for dumping the Exp 1 or Exp 2 Recorder with the TM Transmitter data assignments manually configured, power is not removed from the Exp Recorder Conv when these functions are turned OFF.	a) None.	a) (1) When the Data 2 record command is given, the Exp 2 Recorder tape motion monitor channel (normally K510) indicates no tape motion. Also, the Exp Recorder Bus voltage monitors (normally M520, M521 and M522) indicate zero voltage. (2) Data is not received from the Exp Recorders when the TM Transmitter data assignments are manually configured. (3) The Exp Recorder Bus voltage monitors (normally M520, M521 and M522) indicate the Exp Recorder Bus Conv is powered up continuously.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) (1) There is a loss of recorded Data 2 during the unmanned phases. R/T Data 2 is not affected. (2) Control of the TM Transmitters is normally via the DCS.	b) None.	b) (1) Ground requests that the crew return the TM Transmitters configuration control to the DCS. (2) For recording Data 2, ground requests that the crew momentarily switch the AM Exp 2 switch to the "RECORD" position. This supplies power to the Exp Recorder Conv. (3) Ground can remove power from the Exp Recorder Conv if the Instrumentation System functions are OFF by momentarily switching the PCM Bus Select functions (S274 and S275).	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "AM Exp 1 Record Relay #2" (K3-269) (52-79703-53) or Relay, Latching, "OWS Exp 1 Record Relay #2" (K3-265) (52-79703-53) (Continued)	L M S	a) Pole C fails open in the reset position.	a) (1) If the PCM Bus Conv is powered-down, power is not applied to the PCM Bus Conv when the ground commands Tape Recording - Data 2 RECORD (S330) or Back-up R/T TM ON (268) or the crew manually configures the TM Transmitters for R/T TM Transmission or a Data/Voice dump from the Data Recorder, or crew switches "DATA" switch to "RECORD" position. (2) If the failure occurs when the PCM Bus Conv is powered-up for one or more of the following functions, power is not removed from the Conv when all of the functions are commanded OFF: o Back-up R/T TM ON (S268). o Tape Recording - Data 2 RECORD (S330). o Voice "RECORD". o Exp 1 or Exp 2 "RECORD". o TM Transmitters manually configured for R/T TM transmission or Data/Voice dump. o Data "RECORD" (manually).	a) The "DATA RECORD" light (on Panel 204) does not light up when "DATA" switch is switched to the "RECORD" position.	a) (1) When the Data 2 RECORD command (S330) is given, the Exp 2 Recorder tape motion monitor (normally K510) indicates no tape motion. Also, the PCM Bus voltage monitors (normally M520, M521 and M522) indicate zero voltage. (2) The temperature of the PCM Bus Conv may be slightly higher than expected after time periods when the Conv has supposedly been powered-down.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) Ground can perform switching to overcome the failure.	b) (1) Crew switches the "LIGHTING STATUS" switch (on Panel 207) to the "TEST" position. The "DATA RECORD" light tests good. (2) Crew switches one of the Voice Record switches to the "RECORD" position. The Voice "RECORD" lights come ON. (3) Crew informs ground of the anomaly.	b) (1) Ground requests that the crew return the TM Transmitters configuration control to the DCS. (2) Ground can record Data 2 if they also use the Data RECORD command (S376). (3) Ground can remove power from the PCM Bus Conv by commanding all Instrumentation System functions OFF and then momentarily switching the PCM Bus Select functions (S274 and S275).	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "AM Exp 1 Record Relay #2" (K3-269) (52-79703-53) or	M	a) Latch coil fails open.	a) None. Redundancy of provided by Relay K3-268 (or Relay K3-264).	a) None.	a) None.	a) N/A	- - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None.	b) None.	b) None.	b) IIIb	
Relay, Latching, "OWS Exp 1 Record Relay #2" (K3-265) (52-79703-53) (Continued)	M	a) Reset coil fails open.	a) (1) Power is not removed from the PCM Bus Conv and the Exp Recorder Bus Conv when the AM (or OWS) "Exp 1" switch is switched to the "OFF" position. Power is continuously applied to the following equipment: o PCM Pgar, I/B, H.L.Multiplexers and L.L.Multiplexers. o Group 1 and Group 2 Transducers. o Instrumentation System Signal Conditioners. o Exp 2 Recorder. o MDA and OWS-1 and -2 Signal Conditioners.	a) (1) When the AM (or OWS) "Exp 1" switch is switched to the "OFF" position, the AM and OWS Exp 1 "RECORD" lights do not extinguish. If the end-of-tape is reached, the Exp 1 Recorder "STOP" light (on Panel 204) comes ON.	a) (1) R/T TM indicates that the Exp Recorder Bus is continuously powered-up. (2) R/T TM and recorded Data (subframe 1) indicate that the Exp 1 Recorder has tape motion after power has supposedly been removed from the Recorder.	a) N/A	- - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) (1) Power cannot be removed from the PCM Bus Conv and the Exp Recorder Conv except by opening their circuit breakers. This results in excessive power consumption. The crew can remove power from the Exp 2 Recorder by using the "TAPE RECORDERS" switches on Panel 204.	b) Crew informs ground of the anomaly.	b) (1) Ground requests that the crew manually control the Recorders so that power can be removed from the Exp 1 Recorder. (2) Crew requests that the ground open the Exp Recorder Conv circuit breaker when the Exp Recorders are not being used.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "M509/T013 Exp Control Relay #1" (K3-225) (52-79703-61) (52-79703-61) 3.7.21	M	a) Pole F fails open in the reset position	a) There is a loss of TR Data (+) SF #2 parameter from the I/B to the Exp 1 Rcdr. This results in a loss of recorded Exp 1 (subframe 2) data. R/T subframe 2 data is not affected.	a) None	a) Ground observes a loss of recorded Exp 1 (subframe 2) data. The Exp 1 Rcdr tape motion monitor channel (normally K509) indicates that the Rcdr has been experiencing tape motion.	a) N/A	---
		b) Insulating film on contacts due to contamination	b)(1) Recorded Exp 1 (subframe 2) data can be restored except for the following parameters: o N301 - Vectorcardiogram No. 1. o N304 - Korotkoff Sound Signal. This affects the following experiments: o M-092. o M-093. o M-131. o S-073. o T-027.	b) None	b)(1) Ground requests that crew switch the "TAPE RECORDING EKG/ZPN" switch (on Panel 204) to the "ENABLE" position when subframe 2 is being recorded. This enables recording of subframe 2 data except for N301 (Vectorcardiogram No. 1) and N304 (Korotkoff Sound Signal) but results in the loss of the following recorded subframe 3 parameters: o N302 (Vectorcardiogram No. 2) & N307 (Polarizer Sync). o N303 (Vectorcardiogram No. 3) & N308 (Photomultiplier Current). If Bus A is the PCM Bus, the ground requests that the crew open the "CONTROL RECORDER MAN" circuit breaker prior to switching the "EKG/ZPN" switch to the "ENABLE" position. This restores N302/N307 and N303/N308 recording capability.	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position	a) None - GSE use only.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contemination	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "M509/T013 Exp Control Relay #1" (K3-225) (52-79703-61) (Continued)	L M S	a) Pole E or Pole C fails open in the reset position.	a) None - Pole E and Pole C are not functional in the reset position.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination	b) None	b) None	b) None	b) IIIb	
	SL 1/2 SL 1/3	a) Pole E fails open in the latch position	a) Loss of M509/T013 Data (-) from the Instrumentation Package 2A to Instrumentation Ground.	a) None	a) Ground observes a loss of M509/T013 Experiment Data. Exp 1 Rcdr tape motion monitor indicates the Rcdr has been experiencing tape motion.	a) N/A	---
		b) Insulating film on contacts due to contamination	b) There is a loss of M509/T013 Experiment data.	b) None	b) Ground directs crew while attempting to restore M509/ T013 Experiment Data. Capability of recording M509/T013 data is not restored.	b) IIIb	
	SL 1/2 SL 1/3	a) Pole D fails open in the latch position	a) There is a loss of M509/T013 Clock (+) signal to the Exp 1 (subframe 2) Rcdr.	a) None	a) Ground observes a loss of M509/T013 Experiment Data. The Exp 1 Rcdr tape motion monitor channel (normally K509) indicates that the Rcdr has been experiencing tape motion.	a) N/A	---
		b) Insulating film on contacts due to contamination	b) There is a loss of M509/T013 Experiment Data.	b) None	b) Ground directs crew while attempting to restore M509/ T013 Experiment Data. Capability of recording M509/T013 data is not restored.	b) IIIb	
	SL 1/2 SL 1/3	a) Pole F fails open in the latch position	a) Loss of M509/T013 Data (+) to the Exp 1 Rcdr. This results in a loss of M509/T013 Experiment Data.	a) None	a) Ground observes a loss of M509/T013 Experiment Data.	a) N/A	---
		b) Insulating film on contacts due to contamination	b) There is a loss of M509/T013 Experiment Data.	b) None	b) Ground directs crew while attempting to restore M509/ T013 Experiment Data. Capability of recording M509/T013 data is not restored.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "M509/T013 Exp Control Relay #1" (K3-225) (52-79703-61) (Continued)	M	a) Pole D fails open in the reset position	a) There is a loss of the TR clock from the Pgmr to the Exp 1 Rcdr for recorded subframe 1 data. This results in a loss of recorded subframe 1 data. R/T Subframe 1 is not affected.	a) None	a) Ground observes a loss of recorded Exp 1 (subframe 2) data. The Exp 1 Rcdr tape motion monitor channel (normally K509) indicates the Exp 1 Rcdr has been experiencing tape motion.	a) N/A	-----
		b) Insulating film on contacts due to contamination	b)(1) Recorded Exp 1 (subframe 2) data can be restored except for the following parameters: o N301 - Vectorcardiogram No. 1. o N304 - Korotkoff Sound Signal. This affects the following experiments: o M-092. o M-093. o M-131. o S-073. o T-027.	b) None	b)(1) Ground requests that crew switch the "TAPE RECORDING EKG/ZFN" switch (on Panel 204) to the "ENABLE" position when subframe 2 is being recorded. This enables recording of subframe 2 data except for N301 (Vectorcardiogram No. 1) and N304 (Korotkoff Sound Signal) but results in the loss of the following recorded subframe 3 parameters: o N302 (Vectorcardiogram No. 2) & N307 (Polarizer Sync). o N303 (Vectorcardiogram No. 3) & N308 (Photomultiplier Current). If Bus A is the PCM Bus, the ground request that the crew open the "CONTROL RECORDER MAN" circuit breaker prior to switching the "EKG/ZFN" switch to the "ENABLE" position. This restores N302/N307 and N303/N308 recording capability.	b) IIIb	
	SL 1/2 SL 1/3	a) Pole C fails open in the latch position	a) Loss of M509/T013 Clock (-) from the Instrumentation Package 2A to Instrumentation Ground.	a) None	a) Ground observes a loss of M509/T013 Experiment Data. The Exp 1 Rcdr tape motion monitor channel (normally K509) indicates Rcdr has been experiencing tape motion.	a) N/A	-----
		b) Insulating film on contacts due to contamination	b) There is a loss of M509/T013 Experiment Data.	b) None	b) Ground directs crew while attempting to restore M509/T013 Experiment Data. Capability to record M509/T013 Data is not restored.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "M509/T013 Exp Control Relay #1" (K3-225) (52-79703-61) (Continued)	SL 1/2 SL 1/3	a)(1) Pole B fails open in the reset position, or (2) Latch coil fails open	a) The relay does not cycle to the latch position when the crew attempts to record M509/T013 Experiment Data.	a) None	a) Ground receives recorded Exp 1 (subframe 2) data instead of M509/T013 Experiment Data.	a) N/A	-----
		b)(1) Insulating film on contacts due to contamination (2) Defective wire or terminal due to mechanical or thermal stress	b) There is a loss of M509/T013 Experiment Data.	b) None	b) Ground advises crew while attempting to restore M509/T013 Experiment Data. Capability to record M509/T013 data is not restored.	b) IIIb	
	SL 1/2 SL 1/3	a)(1) Pole B fails open in the latch position, or (2) Reset coil fails open	a) The relay does not cycle to the reset position when M509/T013 is turned OFF.	a) None	a) There is a loss of recorded Exp 1 (subframe 2) data.	a) N/A	-----
		b)(1) Insulating film on contacts due to contamination (2) Defective wire or terminal due to mechanical or thermal stress.	b)(1) Recorded Exp 1 (subframe 2) data can be restored except for the following data: o N301 - Vectorcardiogram No. 1. o N304 - Korotkoff Sound Signal. This affects the following experiments: o M-092. o M-093.	b) None	b)(1) Ground requests that crew switch the "TAPE RECORDING EKG/ZPN" switch (on Panel 204) to the "ENABLE" position when subframe 2 is being recorded. This enables recording of subframe 2 data except for N301 (Vectorcardiogram No. 1) and N304 (Korotkoff Sound Signal) but results in the loss of the following recorded subframe 3 Parameters: o N302 (Vectorcardiogram No. 2) & N307 (Polarizer Sync). o N303 (Vectorcardiogram No. 3) & N308 (Photomultiplier Current). If Bus A is the PCM Bus, the ground request that the crew open the "CONTROL RECORDER MAN" circuit breaker prior to switching the "EKG/ZPN" switch to the "ENABLE" position. This restores N302/N307 and N303/N308 recording capability.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "M-509/T-013 Exp. Control Relay #3" (K3-227) (52-79715-13)	SL 1/2 SL 1/3	a)(1) Pole B fails open when the coil is energized, or (2) Coil fails open.	a) Relay K3-227 does not cycle to the reset position when the crew finishes recording M-509/T-013 Experiment Data. This results in a loss of recorded Exp 1 (subframe 2) data.	a) None	a) Ground observes a loss of recorded Exp 1 (subframe 2) data. The Exp 1 Rcdr tape motion mohitor channel (normally K509) indicates the Exp 1 Rcdr has been experiencing tape motion.	a) N/A	---
3.7.22		b)(1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) (1) Recorded Exp 1 (subframe 2) data can be restored except for the following parameters: o N301 - Vector cardiogram No. 1. o N304 - Korotkoff Sound Signal. This affects the following experiments: o M-092 o M-093 o M-131 o S-073 o T-027	b) None	b)(1) Ground requests that crew switch the "TAPE RECORDING EKG/ZPN" switch (on Panel 204) to the "ENABLE" position when subframe 2 is being recorded. This enables recording of subframe 2 data, except for N301 (Vectorcardiogram No. 1) and N304 (Korotkoff Sound Signal) but results in the loss of the following recorded subframe 3 parameters: o N302 (Vectorcardiogram No. 2) & N307 (Polarizer Sync). o N303 (Vectorcardiogram No. 3) and N308 (Photomultiplier Current). If Bus A is the PCM Bus, the ground request that the crew open the "CONTROL RECORDER MAN" circuit breaker prior to switching the "EKG/ZPN" switch to the "ENABLE" position. This restores N302/N307 and N303/N308 recording capability.	b) IIIb	
		a)(1) Pole A fails open when the coil is energized, or (2) Coil fails open.	a) Relay K3-225 does not cycle to the latch position when the crew attempts to record M-509/T-013 Experiment Data. This results in a loss of M-509/T-013 Experiment Data.	a) None.	a) Ground observes a loss of M-509/T-013 Experiment Data.	a) N/A	---
		b) (1) Insulating film on contacts due to contamination. (Continued on next page)	b) There is a loss of M-509/T-013 Experiment Data.	b) None	b) Ground directs crew while attempting to restore M-509/T-013 Experiment Data. Capability of recording M-509/T-013 Data is not restored.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "M-509/T-013 Exp. Control Relay #3 (K3-227) (52-79715-13)	S/L 1/2 S/L 1/3	b)(2) Defective wire or terminal due to mechanical or thermal stress.					

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Switch, Toggle "TAPE RECORDING DATA" (52-79705-21) 3.7.23	L M S	a) Contact set (2,1) fails open in the "CMD" position.	a) None. This contact set is not functional in the "CMD" position.	a) None.	a) None.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None.	b) None.	b) IIIb	
	M	a) Contact set (2,1) fails open in the "OFF" position.	a) Power is not supplied to the reset coil of the Data 2 Control Relays (K3-314 & K3-315). The Tape Recording - Data 2 RECORD command (S330) is not locked-out. If ground commands Data 2 RECORD, power is applied to the Exp 2 Rcdr.	a) If end-of-tape is reached, the Exp 2 Rcdr "STOP" light (located on Panel 204) comes ON.	a) None.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. To prevent this from occuring if the Exp 2 Rcdr is being replaced, the "TAPE RECORDERS CONTROL" switch is switched to the "MANUAL SELECT" position and the appropriate "TAPE RECORDERS" rotary switch is placed in the "OFF" position.	b) Crew informs ground of the observed anomaly.	b) None.	b) IIIb	
This switch is located in the STS on Panel 204. It has three positions ("CMD", "OFF", and "RECORD") and is used for manual or DCS control of the Data Recorder.	M	a) Contact set (2,3) fails open in the "RECORD" position.	a) Power is not supplied to the latch coil of the Data 2 Control Relays (K3-314 & K3-315) when the Tape Recording - Data 2 RECORD command (S330) is given. This results in a loss of Data 2 (subframe 4) data.	a) None	a)(1) When the Tape Recording - Data 2 RECORD command (S330) is given, the Exp 2 Rcdr Tape Motion Monitor channel (normally K510) indicates there is no tape motion. (2) Loss of recorded Data 2 (subframe 4) data.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) Temporary loss of recorded Data 2 (subframe 4) data. "TAPE RECORDING DATA" switch is normally in the "CMD" position.	b) None	b) Ground requests that the crew return the "TAPE RECORDING DATA" switch to the "CMD" position when possible. This will restore Data 2 recording capability.	b) IIIb	
	M	a) Contact set (5,4) fails open in the "CMD" position.	a) Power is not supplied to the reset coil of the Data Record Mode Relays (K3-274 & K3-275) when the "TAPE RECORDING DATA" switch is switched to the "CMD" position from the "OFF" position.	a) None	a) (1) When the Tape Recording - Data RECORD command (S376) is given, the Data Recorder Tape Motion Monitor channel(normally K508) indicates there is no tape motion. (2) There is missing data when the Data Rcdr is dumped.	a) N/A	---

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Switch, toggle, "TAPE RECORDING DATA" (52-79705-21) (Continued)	M	b) Insulating film on contacts due to contamination.	b) Loss of DCS capability for recording Prime Data (subframe 1). Crew can record Prime Data during manned phases.	b) None	b) Ground requests that the crew manually record Prime Data (subframe 1).	b) IIIb	
	L M S	a) Contact set (5,6) fails open in the "OFF" or "RECORD" position.	a) None. This contact set is a spare.	a) None.	a) None.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	M	a) Contact set (8,7) fails open in the "CMD" position.	a) Power is not supplied to the latch coil of the Data 2 Control Relays (K3-314 & K3-315) when the Tape Recording - Data 2 RECORD command (S330) is given.	a) None.	a)(1) When the Tape Recording - Data RECORD command (S330) is given, the Exp 2 Rcdr Tape Motion Monitor channel (normally X510) indicates there is no tape motion. (2) There is a loss of recorded Data 2 (subframe 4) data.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b)(1) During manned phases, crew can perform switching required to restore Data 2 recording capability. (2) During unmanned phases, recorded Data 2 will not be available.	b) None.	b) Ground requests that the crew switch the "TAPE RECORDING DATA" switch to the "RECORD" position. This restores Data 2 recording capability.	b) IIIb	
	M	a) Contact set (8,9) fails open in the "OFF" position.	a) Power is not supplied to the latch coil of the Data Record Mode Control Relay (K3-274 & K3-275) when the "TAPE RECORDING DATA" switch is switched from the "CMD" position to the "OFF" position. The DCS Tape Recording - Data RECORD command (S376) and Tape Recording - Data 2 RECORD command (S330) are not locked-out. If the crew is replacing one of the Recorders, there is no effect as the "TAPE RECORDERS CONTROL" switch will be in the "MANUAL SELECT" position and the proper "TAPE RECORDERS" rotary switch will be placed in the "OFF" position. This will lock-out power to the Rcdr which is being replaced.	a) None	a) None	a) N/A	---

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Switch, Toggle, "TAPE RECORDING DATA" (52-79705-21) (Continued)	M	b) Insulating film on contacts due to contamination.	b) None. The "TAPE RECORDERS" rotary switches provide redundancy for manually locking-out power from the Recorders.	b) None	b) None	b) IIIb	
	M	a) Contact set (8,9) fails open in the "CMD" position.	a) When the "TAPE RECORDING DATA" switch is switched from the "CMD" to the "RECORD" position, power is not supplied to the latch coil of the Data Record Mode Control Relays (K3-274 & K3-275). This results in power not being supplied to the Data Rcdr.	a) The "DATA RECORD" light (located on Panel 204) does not come ON.	a)(1) Ground observes missing data from the Data Rcdr. (2) The Data Rcdr Tape Motion Monitor channel (normally K508) indicates there is no tape motion.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. Recording of Prime Data (subframe 1) is normally controlled by the ground. Crew can record Prime Data by using the Voice Record switches.	b)(1) Crew switches the "LIGHTING STATUS" switch (located on Panel 207) to the "TEST" position. The "DATA RECORD" light tests good. (2) Crew switches one of the Voice Record switches to the "RECORD" position. The Voice "RECORD" lights come ON indicating the Data Recorder has tape motion. (3) Crew informs ground of observed anomaly.	b)(1) Ground informs crew of observed anomaly. (2) Ground requests that Record Mode Control be returned to DCS "CMD" control.	b) IIIb	
	M	a) Contact set (11,10) fails open in the "CMD" position.	a) Power is not supplied to the reset coil of the Data Record Manual Control Relay #1 (K3-277) when the "TAPE RECORDING DATA" switch is switched from the "RECORD" to the "CMD" position. There is no effect on the operation of the Instrumentation System functions.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	M	a) Contact set (11,10) fails open in the "OFF" position.	a) Power is not supplied to the reset coil of the Data Record Manual Control Relay #1 (K3-277) when the "TAPE RECORDING DATA" switch is switched from the "RECORD" to the "OFF" position. The Data Rcdr continues to record Prime Data (subframe 1).	a) The "DATA RECORD" light (located on Panel 204) does not extinguish.	a)(1) The Data Rcdr Tape motion Monitor Channel (normally K508) indicates there is tape motion after crew has informed ground that the Data Recorder has been turned OFF. (2) Recorded Prime Data (subframe 1) is received for	a) N/A	---

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Switch, Toggle, "TAPE RECORDING DATA" (52-79705-21) (Continued)					a)(2) (Cont'd.) time periods beyond which Data Rcdr was supposed to have been turned off.		
		b) Insulating film on contacts due to contamination.	b) None. Power can be removed from the Data Rcdr. DCS control of the Data Rcdr is still possible.	b)(1) Upon direction from the ground, the crew removes power from the Data Rcdr by using the "TAPE RECORDERS" rotary switches (on Panel 204). The "DATA RECORD" light then extinguishes.	b) Ground coordinates with crew to determine what corrective action is necessary.	b) IIIb	
	M	a) Contact set (11, 12) fails open in the "RECORD" position.	a) Power is not supplied to the latch coil of the Data Record Manual Control Relay #1 (K3-277) when the "TAPE RECORDING DATA" switch is switched to the "RECORD" position. This results in a loss of power for recording Prime Data (subframe 1) by this means.	a) The "DATA RECORD" light (located on Panel 204) does not come ON.	a)(1) The Data Rcdr Tape Motion Monitor channel (normally K508) indicates there is no tape motion. (2) Ground observes missing data from the Data Rcdr.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. The crew can still record Prime Data. DCS control of the Data Rcdr is not affected by this failure.	b)(1) Crew switches the "LIGHTING STATUS" switch (located on Panel 207) to the "TEST" position. The "DATA RECORD" light tests good. (2) Crew switches one of the Voice Record switches to the "RECORD" position. The Voice "RECORD" light comes ON indicating the Data Rcdr has tape motion. (3) Crew informs ground of the observed anomaly.	b)(1) Ground informs crew of observed anomaly. (2) Ground requests that Record Mode Control be returned to DCS "CMD" control.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Circuit Breaker Magnetic, "OWS MUX Heaters 1" (3-92) (52-79721-316) (9.3 amps) 3.8.1 or Circuit Breaker Magnetic, "OWS MUX Heater 2" (3-93) (52-79721-316) (9.3 amps) 3.8.2 (Either one of these two.	L M S	a) Opens before normal break current is exceeded.	a) (1) If C/B 3-92 opens, there is a loss of power to the following OWS Multiplexer Heaters: o L/L "M" Mux. o L/L "K" Mux. o L/L "L" Mux. o L/L "Q" Mux. o H/L "E" Mux. o H/L "K" Mux. (2) If C/B 3-93 opens, there is a loss of power to the following OWS Multiplexer Heaters: o L/L "H" Mux. o L/L "J" Mux. o L/L "D" Mux. o H/L "H" Mux. o H/L "J" Mux. o H/L "D" Mux. (3) During long dormant periods there is a possibility of the affected Muxes becoming so cold that their performance is out of specification when they are powered up.	a) The circuit breaker bat handle is in the open position.	a) If affected Muxes become too cold to operate within specification, ground observes questionable data from these Muxes.	a) N/A	---
		b) Internal defect, coil shorts to ground.	b) (1) There is no effection the mission. Heat from surrounding equipment will warm-up the Muxes if they are operating out-of-spec due to low temperature.	b) Crew attempts to reset the the circuit breaker.	b) Ground informs crew of the anomaly.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Circuit Breaker Magnetics, "SIGNAL CONDITIONING OWS 1" (3-90) (52-79721-316) 9.3 amps) 3.8.3 or Circuit Breaker Magnetic, "SIGNAL CONDITIONING OWS 2" (3-91) (52-79721-316) (9.3 amps) 3.8.4 (Either one of these two)	L M S	a) Opens before normal break current is exceeded.	a) Loss of power to the OWS-1 or -2 signal conditioners.	a) The circuit breaker bat handle is in the open position.	a) Ground observes a loss of TM data from the affected signal conditions.	a) N/A	---
		b) Internal defect, coil short to ground.	b) None. Lost data is not mission critical.	b) Crew attempts to reset the circuit breaker.	b) Ground informs crew of the anomaly.	b) IIIb	
Circuit Breaker Magnetic, "SIGNAL CONDITIONING MDA" (3-94) (52-79721-322) (3.9 amps) 3.8.5	L M S	a) Opens before norvel break current is exceeded.	a) Loss of power to the MDA signal conditioner.	a) The circuit breaker bat handle is in the open position.	a) Ground observes a loss of TM data from the MDA signal conditioner.	a) N/A	---
		b) Internal defect, coil short to ground.	b) None. Lost data is not mission critical.	b) Crew attempts to reset the circuit breaker.	b) Ground informs crew of the anomaly.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Power Manual Control Relay #1" (K3-114) (52079703-53) 3.8.6	L M S	a) Pole F or Pole E or Pole D fails open in the reset or latch position.	a) None - These poles are spares.	a) None	a) None	a) N/A	------
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole C fails open in the reset position.	a) None - Pole C is not functional in the reset position.	a) None	a) None	a) N/A	------
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) (1) Pole C fails open in the latch position or, (2) Latch coil fails open.	a) Power is not supplied to the MDA Signal Conditioner when the crew switches the "DATA" switch (on Panel 204) to the "RECORD" position, the ground commands Tape Recording - Data 2 RECORD (S330) or Backup R/T TM ON (S268), or the crew manually transmits R/T TM.	a) None	a) Ground observes a loss of data from the MDA Signal Conditioner.	a) N/A	------
		b) (1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) Temporary loss of data from the MDA Signal Conditioner. Power to the Signal Conditioner can be restored.	b) None	b) (1) Ground uses the R/T TM ON command (11-2) or Tape Recording - Data RECORD command (S376) to restore MDA Signal Conditioner power, or (2) Ground requests that the crew switch a Voice Record switch to the "RECORD" position or an "EXP 1" switch to the "RECORD" position. Power to the MDA Signal Conditioner is restored.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Power Manual Control Relay #1" (K3-114) (52-79703-53) (Continued)	L M S	a) Pole B fails open in the reset or latch position.	a) None. Pole B of relay K3-53 provides redundancy.	a) None	a) None	a) N/A	------
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	------
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Reset coil fails open.	a) Power is not removed from the MDA Signal Conditioner when the appropriate crew or ground commands are given to cycle Relays K3-114 and K3-53 to the reset position.	a) None	a) None	a) N/A	------
		b) Defective wire or coil due to mechanical or thermal stress.	b) None, other than excessive power consumption.	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Power Manual Control Relay #3" (K3-53) (52-79703-79) 3.8.7	L M S	a) Pole D or Pole C fails open in the reset position.	a) None - These poles are not functional in the reset position.	a) None	a) None	a) N/A	------
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole D fails open in the latch position.	a) OWS -1 Signal Conditioning power is not supplied to the OWS when the crew switches the "DATA" switch (on Panel 204) to the "RECORD" position, the ground commands Tape Recording - Data 2 RECORD (S330) or Backup R/T TM ON (S268), or the crew manually transmits R/T TM.	a) None	a) (1) Ground observes a loss of data from the OWS -1 Signal Conditioners.	a) N/A	------
		b) Insulating film on contacts due to contamination.	b) Temporary loss of OWS -1 Signal Conditioner data. The power can be restored.	b) None	b) (1) Ground uses the R/T TM ON command (11-2) or Tape Recording - Data RECORD command (S376) to restore OWS -1 Signal Conditioning power, or (2) Ground requests that the crew switch a Voice Record switch to the "RECORD" position or an "EXP 1" switch to the "RECORD" position. Power to the OWS -1 Signal Conditioners is restored.	b) IIIb	
	L M S	a) Pole B fails open in the reset or latch position.	a) None - Redundancy is provided by Pole B on Relay K3-114.	a) None	a) None	a) N/A	------
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Power Manual Control Relay #3" (K3-53) (52-79703-79) (Continued)	L M S	a) Pole C fails open in the latch position.	a) OWS -2 Signal Conditioning power is not supplied to the OWS when the crew switches the "DATA" switch (on Panel 204) to the "RECORD" position, the ground commands Tape Recording - Data 2 RECORD (S330) or Backup R/T TM ON (S268), or the crew manually transmits R/T TM.	a) None	a) (1) Ground observes a loss of data from the OWS -2 Signal Conditioners.	a) N/A	------
		b) Insulating film on contacts due to contamination.	b) Temporary loss of OWS -2 Signal Conditioner data. The power can be restored.	b) None	b) (1) Ground uses the R/T TM ON command (11-2) or Tape Recording - Data RECORD command (S376) to restore OWS -2 Signal Conditioning power, or (2) Ground requests that the crew switch a Voice Record switch to the "RECORD" position or an "EXP 1" switch to the "RECORD" position. Power to the OWS -2 Signal Conditioners is restored.	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only	a) None	a) None	a) N/A	------
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Power Manual Control Relay #3" (K3-53) (52-79703-79) (Continued)	L M S	a) Latch coil fails open.	a) Power is not supplied to the OWS -1 & -2 Signal Conditioners when the crew switches the "DATA" switch (on Panel 204) to the "RECORD" position, the ground commands Tape Recording - Data 2 RECORD (S330) or Backup R/T TM ON (S268), or the crew manually transmits R/T TM.	a) None	a) Ground observes a loss of data from the OWS -1 & -2 Signal Conditioners.	a) N/A	------
		b) Defective wire or terminal due to mechanical or thermal stress.	b) Temporary loss of data from these signal conditioners. The power to the signal conditioners can be restored.	b) None	b) (1) Ground uses the R/T TM ON command (11-2) or Tape Recording - Data RECORD command (S376) to restore MDA & OWS -1 & -2 Signal Conditioning power, or (2) Ground requests that the crew switch a Voice Record switch to the "RECORD" position or an "EXP 1" switch to the "RECORD" position. Power to the affected signal conditioners is restored.	b) IIIb	
	L M S	a) Reset coil fails open.	a) Power is not removed from the OWS -1 & -2 Signal Conditioners when the appropriate crew or ground commands are given to cycle Relays K3-114 and K3-53 to the reset position.	a) None	a) None	a) N/A	------
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None, other than excessive power consumption.	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "PCM Power Manual Control Relay #2" (K3-115) (52-79715-13) 3.8.8	L M S	a) (1) Pole B fails open when coil is energized, or (2) The coil fails open.	a) Relays K3-53 and K3-114 do not cycle to the latch position. Power is not supplied to the MDA and OWS-1 & -2 Signal Conditioners when the crew switches the "DATA" switch (on Panel 204) to the "RECORD" position, the ground commands Tape Recording - Data 2 RECORD (S330) or Backup R/T TM ON (S268), or the crew manually transmits R/T TM.	a) None	a) Ground observes a loss of data from the MDA and OWS -1 & -2 Signal Conditioners.	a) N/A	------
		b) (1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) Temporary loss of data from the affected signal conditioners.	b) None	b) (1) Ground uses the R/T TM ON command (11-2) or Tape Recording - Data RECORD command (S376) to restore power to the affected signal conditioners, or (2) Ground requests that the crew switch a voice Record or an Exp 1 switch to the "RECORD" position to restore power to the affected signal conditioners.	b) IIIb	
	L M S	a) (1) Pole A fails open when the coil is energized, or (2) Coil fails open.	a) Relays K3-53 and K3-114 do not cycle to the latch position. Power is not removed from the MDA and OWS -1 & -2 Signal Conditioners when the crew switches the "DATA" switch (on Panel 204) to the "OFF" position, the ground commands Tape Recording - Data 2 OFF (S331) or Backup R/T TM OFF (S269) or the crew turns off R/T TM transmission.	a) None	a) None		

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "PCM Power Manual Control Relay #2" (K3-115) (52-79715-13) (Continued)	L M S	b) (1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) None, other than excessive power consumption.	b) None	b) None		

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Power CMD Control Relay #1" (K3-116) (52-79703-53) 3.8.9	L M S	a) Pole F or Pole E or Pole D fails open in the reset or latch position, or Pole C fails open in the reset position.	a) None - These poles are not functional in these positions.	a) None	a) None	a) N/A	------
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) (1) Pole C fails open in the latch position, or (2) Latch coil fails open.	a) Power is not supplied to the MDA Signal Conditioner when ground commands R/T TM ON (11-2) or Tape Recording - Data RECORD (S376).	a) None	a) Ground observes a loss of data from the MDA Signal Conditioner.	a) N/A	------
		b) (1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) Temporary loss of data from the affected signal conditioners.	b) None	b) (1) Ground uses the Backup R/T TM ON command (S268) or Tape Recording - Data 2 RECORD command (S330) to restore power to the MDA signal conditioner, or (2) Ground requests that the crew control the transmission of R/T TM or the recording of Data (Subframe 1) to restore power to the MDA Signal Conditioner.		
	L M S	a) Pole B fails open in the reset or latch position.	a) None - Redundancy is provided by Relay K3-54.	a) None	a) None	a) N/A	------
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Power CMD Control Relay #1" (K3-116) (52-79703-53) (Continued)	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	------
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Reset coil fails open.	a) Power is not removed from the MDA Signal Conditioner when the ground commands R/T TM OFF (11-2) or Tape Recording - Data OFF (8377), or the crew switches the Voice Record switch(es) OFF or the Exp 1 switch(es) OFF.	a) None	a) None	a) N/A	------
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None, other than excessive power consumption.	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Power CMD Control Relay #3" (K3-54) (52-79703-74) 3.8.10	L M S	a) Pole D or Pole C fails open in the reset position.	a) None - These poles are not functional in the reset position.	a) None	a) None	a) N/A	------
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole D fails open in the latch position.	a) Power is not supplied to the OWS -1 Signal Conditioners when the ground commands R/T TM ON (11-2) or Tape Recording - Data RECORD (8376).	a) None	a) Ground observes a loss of data from the OWS -1 Signal Conditioners.	a) N/A	------
		b) Insulating film on contacts due to contamination.	b) Temporary loss of data from the affected signal conditioners.	b) None	b) (1) Ground uses the Backup R/T TM ON command (S268) or Tape Recording - Data 2 RECORD command (8330) to restore power to the OWS -1 Signal Conditioners or, (2) Ground requests that the crew control the transmission of R/T TM or the recording of Data (Subframe 1) to restore power to the OWS -1 Signal Conditioners.		
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	------
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Power CMD Control Relay #3" (K3-54) (52-79703-79)	L M S	a) Pole C fails open in the latch position.	a) Power is not supplied to the OWS -2 Signal Conditioners when the ground commands R/T TM ON (11-2) or Tape Recording - Data RECORD (S376).	a) None	a) Ground observes a loss of data from the OWS -2 Signal Conditioners.	a) N/A	------
(Continued)		b) Insulating film on contacts due to contamination.	b) Temporary loss of data from affected signal conditioners.	b) None	b) (1) Ground uses the Backup R/T TM ON command (S268) or Tape Recording - Data 2 RECORD command (S330) to restore power to the OWS -2 Signal Conditioners, or (2) Ground requests that the crew control the transmission of R/T TM or the recording of Data (Subframe 1) to restore power to the OWS -2 Signal Conditioners.	b) IIIb	
	L M S	a) Latch coil fails open.	a) Power is not supplied to the OWS -1 & -2 Signal Conditioners when the ground commands R/T TM ON (11-2) or Tape Recording - Data RECORD (S376).	a) None	a) Ground observes a loss of data from the OWS -1 & -2 Signal Conditioners.	a) N/A	------
		b) Defective wire or terminal due to mechanical or thermal stress.	b) Temporary loss of data from affected signal conditioners.	b) None	b) (1) Ground uses the Backup R/T TM ON command (S268) or Tape Recording - Data 2 RECORD command (S330) to restore power to the OWS -1 & -2 Signal Conditioners, or (2) Ground requests that the crew control the transmission of R/T TM or the recording of Data (Subframe 1) to restore power to the OWS -1 & -2 Signal Conditioners.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Power CMD Control Relay #3" (K3-54) (52-79703-79) (Continued)	L M S	a) Reset coil fails open.	a) Power is not removed from the OWS -1 & -2 Signal Conditioners when the ground commands R/T TM OFF (11-2) or Tape Recording - Data OFF (S377), or the crew switches the Voice Record switch(es) OFF or the Exp 1 switch(es) OFF.	a) None	a) None	a) N/A	------
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None, other than excessive power consumption.	b) None	b) None	b) IIIb	
	L M S	a) Pole B fails open in the reset or latch position.	a) None - Redundancy is provided by Relay K3-116.	a) None	a) None	a) N/A	------
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "PCM Power CMD Control Relay #2" (K3-117) (52-79715-13) 3.8.11	L M S	a) (1) Pole B fails when coil is energized, or (2) Coil fails open.	a) Relays K3-54 and K3-116 cannot be cycled to the latch position. This results in power not being supplied to the MDA and OWS -1 & -2 when the ground commands R/T TM ON (11-2) or Tape Recording - Data RECORD (S376).	a) None	a) Ground observes a loss of data from the MDA and OWS -1 & -2 Signal Conditioners.	a) N/A	------
		b) (1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) Temporary loss of data from the affected signal conditioners.	b) None	b) (1) Ground uses the Backup R/T TM ON command (S268) or Tape Recording - Data 2 RECORD command (S330) to restore power to the MDA and OWS -1 & -2 Signal Conditioners, or (2) Ground requests that the crew control the transmission of R/T TM or the recording of Data (Subframe 1) to restore power to the MDA and OWS -1 & -2 Signal Conditioners.	b) IIIb	
	L M S	a) (1) Pole A fails open when the coil is energized, or (2) Coil fails open.	a) Relays K3-54 and K3-116 cannot be cycled to the reset position. Power is not removed from the MDA and OWS -1 & -2 Signal Conditioners when the ground commands R/T TM OFF (11-2) or Tape Recording Data OFF (S377), or the crew switches the Voice Record switch(es) OFF or the Exp 1 switch(es) OFF.	a) None	a) None	a) N/A	------
		b) (1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) None, other than excessive power consumption.	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Bus Select Relay #3" (K3-305) (52-79703-61) 3.9.01	L M S	a) Pole E fails open in the reset position	a) (1) When the crew and ground remove all commands which require that the Exp 2 Rcdr be powered-up, the Power Relays for the Exp 2 Rcdr do not reset. Power is applied to the Exp 2 Rcdr whenever the Exp Rcdr Bus is powered-up. (2) If Rcdr is powered-down when failure occurs, power is not supplied to the Rcdr when ground attempts to dump the Rcdr.	a) (1) When the crew switches the "EXP 2" switches to the "OFF" position, sounds emitted from the Rcdr indicate it is still running. The Exp 2 "RECORD" lights extinguish as expected. (2) If the end-of-tape is reached, the Exp 2 Rcdr "STOP" light comes ON.	a) (1) After ground powers down the Rcdr, R/T TM indicates it has tape motion and that dump OFF commands were correctly received and decoded by the DCS. (2) If Rcdr is powered-down when failure occurs, data and voice are not received when ground dumps the Rcdr. The Xmtrs' carrier waves are received. R/T TM indicates there is no tape motion, that the Exp Rcdr Bus is powered-up, and that the dump commands were correctly received and decoded by the DCS.	a) N/A	-
		b) Insulating film on contacts due to contamination.	b) None, assuming there has not been a prior failure which prevents using Bus B as the PCM Bus.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew informs the ground of the anomaly.	b) Ground switches to Bus B as the PCM Bus.	b) IIIb	
	L M S	a) Pole D fails open in the reset position.	a) There is a partial loss of control of power to the Exp 2 Rcdr. Power is not supplied to the Rcdr when crew attempts to record Exp 1 data or the ground attempts to record Data 2 (subframe 4) data. Power is supplied to the Rcdr when the ground dumps the Rcdr.	a) When an "EXP 2" switch is switched to the "RECORD" position, the Exp 2 "RECORD" lights do not come ON. Audio indication is that the Rcdr is not running.	a) (1) When ground attempts to record Data 2 (subframe 4), R/T TM indicates there is no tape motion but that the Exp Rcdr Bus is powered-up. (2) When ground dumps the Exp 2 Rcdr, they observe that no new data has been recorded since the previous dump.	a) N/A	-

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Bus Select Relay #3" (K3-305) (52-79703-61) (Continued)		b) Insulating film on contacts due to contamination.	b) None, assuming there has not been a prior failure which prevents using Bus B as the PCM Bus.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground switches to Bus B as the PCM Bus.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Bus Select Relay #3" (K3-305) (52-79703-61) (Continued)	L M S	a) Pole C fails open in the reset position.	a) (1) When crew and ground remove all commands which require powering up the Data Rcdr, the Power Relays for the Data Rcdr do not reset. Power is applied to the Data Rcdr whenever the PCM Bus is powered-up. (2) If Rcdr is powered-down when the failure occurs, power is not supplied to the Rcdr when ground attempts to dump the Rcdr.	a) (1) When the crew powers down the Data Rcdr, sounds emitted from the Rcdr indicate it is still running, i.e., if the PCM Bus is still powered-up. The Data and/or Voice "RECORD" lights extinguish as expected. (2) If end-of-tape is reached the Data Rcdr "STOP" light (on Panel 204) comes ON.	a) (1) After ground powers down the Data Rcdr, R/T TM indicates it has tape motion and that the commands were correctly received and decoded by the DCS. (2) If Rcdr is powered-down when failure occurs, data and voice are not received when ground dumps the Rcdrs. The Xmtrs' carrier waves are received. R/T TM indicates there is no tape motion, and that the dump commands were correctly received and decoded by the DCS.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None, assuming there has not been a previous failure which prevents using Bus B as the PCM Bus.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew informs the ground of the anomaly.	b) Ground switches to Bus B as the PCM Bus.	b) IIIb	
	L M S	a) Pole B fails open in the reset position.	a) There is a partial loss of control of power to the Data Rcdr. Power is not supplied to the Rcdr when crew or ground attempts to record data or voice (crew controlled) on the Rcdr. Power is supplied to the Rcdr when ground attempts to dump the Rcdr.	a) When crew switches the "DATA" or a voice record switch to the "RECORD" position, their respective "RECORD" indicator lights do not come ON.	a) (1) When the ground attempts to record data on the data Rcdr, R/T TM indicates there is no tape motion. (2) When the ground dumps the Data Rcdr, they observe that no new data has been recorded since the previous dump.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None, assuming there has not been a previous failure which prevents using Bus B as the PCM Bus.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground switches to Bus B as the PCM Bus.	b) IIIb	

*COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Bus Select Relay #3" (K3-305) (52-79703-61) (Continued)	L M S	a) Pole E fails open in the latch position.	a) Same as Pole E fails open in the reset position.	a) See Pole E fails open in the reset position.	a) See Pole E fails open in the reset position.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None, assuming there has not been a prior failure which prevents using Bus A as the PCM Bus.	b) See Pole E fails open in the reset position.	b) Ground switches to Bus A as the PCM Bus.	b) IIIb	
	L M S	a) Pole D fails open in the latch position.	a) Same as Pole D fails open in the reset position.	a) See Pole D fails open in the reset position.	a) See Pole D fails open in the reset position.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None, assuming there has not been a prior failure which prevents using Bus A as the PCM Bus.	b) See Pole D fails open in the reset position.	b) Ground switches to Bus A as the PCM Bus.	b) IIIb	
	L M S	a) Pole C fails open in the latch position.	a) Same as Pole C fails open in the reset position.	a) Same as Pole C in the reset position.	a) Same as Pole C in the reset position.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None, assuming there has not been a prior failure which prevents using Bus A as the PCM Bus.	b) Same as Pole C in the reset position.	b) Ground switches to Bus A as the PCM Bus.	b) IIIb	
	L M S	a) Pole B fails open in the latch position.	a) Same as Pole B fails open in the reset position.	a) Same as Pole B in the reset position.	a) Same as Pole B in the reset position.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None, assuming there has not been a prior failure which prevents using Bus A as the PCM Bus.	b) Same as Pole B in the reset position.	b) Ground switches to Bus A as the PCM Bus.	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position	a) None - GSE use only	a) None.	a) None.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole F fails open in the reset (or latch) position.	a) None - This pole is a spare.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIO
Relay, Latching, "PCM Bus Select Relay #3" (K3-305) (52-79703-61) (Continued)	L M S	a) Latch coil fails open.	a) When the ground gives the PCM Bus Select B command (S274) Relay K3-305 does not cycle to the latch position. Power is not supplied to the Exp 1 or Data Rcdrs when the crew on ground attempts to use them.	a) When the crew switches the "DATA" switch or a voice switch or an "EXP 1" switch to the "RECORD" position, their respective "RECORD" lights do not sound like they are operating.	a) When ground attempts to use the Data Rcdr or the Exp 1 Rcdr for recording or dumping data, R/T TM indicates there is no tape motion and that Bus A and/or Bus B is powered-up. NOTE - Ground cannot record data on Exp 1 Rcdr.	a) N/A	---
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None, provided there has not been a prior failure which prevents using Bus A as the PCM Bus.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground switches to Bus A as the PCM Bus.	b) IIIb	
	L M S	a) Reset coil fails open.	a) When ground gives the PCM Bus Select A command (S275), Relay K3-305 does not cycle to the reset position. Power is not supplied to the Exp 1 or Data Rcdrs when the crew or ground attempts to use them.	a) Same as for the latch coil fails open.	a) Same as for the latch coil fails open.	a) N/A	---
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None, provided there has not been a prior failure which prevents using Bus B as the PCM Bus.	b) Same as for the latch coil fails open.	b) Ground switches to Bus B as the PCM Bus.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Bus Select Relay #14" (K3-371) (52-79703-77) 3.9.02	L M S	a) Pole E fails open in the reset position.	a) There is a loss of control of power to the Data Rcdr. If the Rcdr Power Relays are latched, Rcdr will be powered-up whenever the PCM Bus is powered-up. If Rcdr Power Relays are reset, power is not supplied to the Data Rcdr when crew or ground attempts to use the Rcdr.	a) (1) If Data Rcdr is powered-down, "RECORD" indicator lights do not come ON when crew switches "DATA" switch or a Voice Record Switch to the "RECORD" position. (2) If Rcdr is powered-up when failure occurs, sounds emitted by the Rcdr indicate the Rcdr is still running after crew switches "DATA" and Voice Record switches to the "OFF" position, i.e. provided PCM Bus is powered-up. If end-of-tape is reached, Data Rcdr "STOP" light comes ON. "RECORD" lights extinguish as expected.	a) (1) If Data Rcdr is powered-down when failure occurs, R/T TM indicates there is no tape motion when ground attempts to use the Rcdr via DCS commands. Data & Voice are not received when ground attempts to dump the Rcdr. (2) If Data Rcdr is powered-up when the failure occurs, R/T TM indicates there is tape motion after the ground has commanded the Rcdr OFF.	a) N/A	--
		b) Insulating film on contacts due to contamination.	b) None, provided there has not been a prior failure which prevents switching to Bus B as the PCM Bus.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch to test the "RECORD" lights on Panel 204.	b) Ground switches to Bus B as the PCM Bus.	b) IIIb	
	L M S	a) Pole E fails open in the latch position	a) Same as for Pole E fails open in the reset position.	a) Same as for Pole E fails open in the reset position.	a) Same for Pole E fails open in the reset position.	a) N/A	--
		b) Insulating film on contacts due to contamination.	b) None, provided there has not been a prior failure which prevents switching to Bus A as the PCM Bus.	b) Same as for Pole E fails open in the reset position.	b) Ground switches to Bus A as the PCM Bus.	b) IIIb	
	L M S	a) Pole F fails open in the reset or latch position.	a) None - Pole F is a spare	a) None	a) None	a) N/A	--
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Bus Select Relay #14" (K3-371) (52-79703-77) (continued)	M	a) Pole D fails open in the reset position.	a) There is a loss of control of power to the Exp 1 Rcdr. If the Rcdr Power Relays are latched, Rcdr will be powered-up whenever the PCM Bus is powered-up. If Rcdr Power Relays are reset, power is not supplied to the Exp 1 Rcdr when crew or ground attempts to use the Rcdr.	a) (1) If Exp 1 Rcdr is powered-down, "RECORD" indicator lights do not come ON when crew switches an "EXP 1" switch to the "RECORD" position. (2) If Rcdr is powered-up when failure occurs, sounds esitted by the Rcdr indicate the Rcdr is still running after crew switches "EXP 1" switches "OFF", i.e. provided PCM Bus is powered-up. If end-of-tape is reached, Exp 1 Rcdr "STOP" light comes ON. "RECORD" lights extinguish as expected.	a) (1) If Exp 1 Rcdr is powered-down when failure occurs, R/T TM indicates there is no tape motion when ground attempts to use the Rcdr via DCS commands. Exp 1 data & Exp Voice are not received when ground attempts to dump the Rcdr. TM indicates Exp Rcdr Bus is powered-up (2) If the Exp 1 Rcdr is powered-up when the failure occurs, R/T TM indicates Rcdr is powered-up whenever the Exp Rcdr Bus is powered-up.	a) N/A	--
		b) Insulating film on contacts due to contamination.	b) None, assuming there has not been a prior failure which prevents using Bus B as the PCM Bus.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch to test the "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground switches to Bus B as the PCM Bus.	b) IIIb	
	M	a) Pole D fails open in the latch position.	a) Same as for Pole D fails open in the reset position.	a) Same as for Pole D fails open in the reset position.	a) Same as for Pole D fails open in the reset position.	a) N/A	--
		b) Insulating film on contacts due to contamination.	b) None, assuming there has not been a prior failure which prevents using Bus A as the PCM Bus.	b) Same as for Pole D fails open in the reset position.	b) Ground switches to Bus A as the PCM Bus.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Bus Select Relay #14" (K3-371) (52-79703-77) (Continued)	M	a) Pole C fails open in the reset position.	a) There is a partial loss of control of power to the Exp 1 Rcdr. If the Rcdr Power Relays are latched, Rcdr will be powered-up whenever the PCM Bus is powered-up. If Rcdr is powered-down, power is not supplied to the Exp 1 Rcdr when the ground gives the dump command (10-2).	a) If Exp 1 Rcdr is powered-up when failure occurs, sounds emitted by the Rcdr indicate the Rcdr is still running after crew switches "EXP 1" switches "OFF", i.e. provided PCM Bus is powered-up. If end-of-tape is reached, Exp 1 Rcdr "STOP" light comes ON. "RECORD" lights extinguish as expected.	a) (1) If Exp 1 Rcdr is powered-down when the crew attempts to dump the Rcdr, data & voice are not received from the the Rcdr. Only the carrier wave is received from the Xmtrs. R/T TM indicates there is no tape motion that the Exp Rcdr Bus is powered-up, and that the dump commands were correctly received and decoded by the DCS.	a) N/A	--
		b) Insulating film on contacts due to contamination	b) None, assuming there has not been a prior failure which prevents using Bus B as the PCM Bus.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew informs the ground of the anomaly.	b) Ground switches to Bus B as the PCM Bus.	b) IIIb	
	M	a) Pole C fails open in the latch position.	a) Same as for Pole C fails open in the reset position.	a) Same as for Pole C fails open in the reset position.	a) Same as for Pole C fails open in the reset position.	a) N/A	--
		b) Insulating film on contacts due to contamination	b) None, assuming there has not been a prior failure which prevents using Bus A as the PCM Bus.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew informs the ground of the anomaly.	b) Ground switches to Bus A as the PCM Bus.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
elay, Latching, PCM Bus Select elay #14" K3-371) 52-79703-77) Continued)	M	a) Pole B fails open in the reset position.	a) When the crew attempts to record Exp 1 data, power is not supplied to the Rcdr. Dumping of the Rcdr is not affected.	a) When the crew switches an "EXP 1" switch to the "RECORD" position, the Exp 1 "RECORD" lights do not come ON. The Rcdr does not sound like it is running.	a) When the ground dumps the Exp 1 Rcdr, they observe that no new data has been recorded since the previous dump.	a) N/A	--
		b) Insulating film on contacts due to contamination.	b) None, assuming there has not been a prior failure which prevents using Bus B as the PCM Bus.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test "RECORD" Lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground switches to Bus B as the PCM Bus.	b) IIIb	
	M	a) Pole B fails open in the latch position.	a) Same as for Pole B fails open in the reset position.	a) Same as for Pole B fails open in the reset position.	a) Same as for Pole B fails open in the reset position.	a) N/A	--
		b) Insulating film on contacts due to contamination.	b) None, assuming there has not been a prior failure which prevents using Bus A as the PCM Bus.	b) Same as for Pole B fails open in the reset position.	b) Ground switches to Bus A as t the PCM Bus.	B) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	--
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Bus Select Realy #14" (K3-371) (52-79703-77) (Continued)	M	a) Latch coil fails open	a) When the ground uses the PCM Bus Select B (S278) command, Relay K3-371 does not cycle to the latch position, Power is not supplied to the Exp 1 or DATA Rcdrs when the crew or ground attempts to use them.	a) The "RECORD" indicator lights do not come ON when crew switches an "EXP 1" or "DATA" switch to the "RECORD" Position. Audio indication is that the Rcdr is not running.	a) R/T TM indicates there is no tape motion when ground attempts to use the Rcdr via DCS commands. Data and Voice are not received from either Rcdr when the ground attempts to dump them. Only the carrier wave is received from the Xmtrs. R/T TM indicates the Exp Rcdr and PCM +24 volt buses are powered-up.	a) N/A	--
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None, assuming there has not been a prior failure which prevents using Bus A as the PCM Bus.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch to test the "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground switches to Bus A as the PCM Bus.	b) IIIb	
	M	a) Reset coil fails open.	a) When the ground uses the PCM Bus Select A (S275) command, Relay K3-371 does not cycle to the reset position, Power is not supplied to the Exp 1 or Data Rcdrs when the crew or ground attempts to use them.	a) The "RECORD" indicator lights do not come ON when crew switches an "EXP 1" or "DATA" switch to the "RECORD" position. Audio indication is that the Rcdr is not running.	a) R/T TM indicates there is no tape motion when ground attempts to use the Rcdr via DCS commands. Data and Voice are not received from either Rcdr when the ground attempts to dump them. Only the carrier wave is received from the Xmtrs. R/T TM indicates the Exp Rcdr and PCM +24 volt buses are powered-up.	a) N/A	--
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None, assuming there has not been a prior failure which prevents using Bus B as the PCM Bus.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cuase the anomaly.	b) Ground switches to Bus B as the PCM Bus.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching "PCM Bus Select Relay #14" (K3-371) (52-79703-77) (Continued)				(2) Crew uses the "LIGHTING STATUS" switch to test the "RECORD" lights on Panel 234. (3) Crew informs the ground of the anomaly.			

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Bus Select Relay #6" (K3-308) (52-79703-61) 3.9.03	L M S	a) Pole F fails open in the reset position.	a) There is a loss of control of power to the Exp 2 Rcdr. If the Rcdr Power Relays are latched, Rcdr will be powered-up whenever the Exp Rcdr Bus is powered-up. If the Rcdr Power Relays are reset, power is not supplied to the Exp 2 Rcdr when the crew or ground attempts to use the Rcdr.	a) (1) When the crew switches the "EXP 2" switches to the "OFF" position, sounds emitted from the Rcdr indicate it is still running, i.e., if the Exp Rcdr Bus is still powered-up. The Exp 2 "RECORD" lights extinguish as expected. (2) If the end-of-tape is reached, the Exp 2 Rcdr "STOP" light comes ON. (3) If the Exp 2 Rcdr is powered-down when the failure occurs, when the crew switches an "EXP 2" switch to the "RECORD" position the Exp 2 "RECORD lights do not come ON.	a) (1) If Rcdr is powered-up when the failure occurs, when the ground powers down the Rcdr, R/T TM indicates the Exp 2 Rcdr continues to have tape motion (i.e., if the Exp Rcdr Bus is powered-up for the Exp 1 Rcdr) and that the dump "OFF" commands were correctly received and decoded by the DCS. (2) If Rcdr is powered-down when the failure occurs, data is not received when Rcdr is dumped. The Xmtr's carrier wave is received. When ground commands Exp 2 Rcdr record or dump, R/T TM indicates the dump commands are correctly received and decoded by the DCS, and that there is no tape motion, for either record or dump commands.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None, assuming there has not been a prior failure which prevents using Bus B as the PCM Bus.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test the "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground switches to Bus B as the PCM Bus.	b) IIIb	
	L M S	a) Pole F fails open in the latch position.	a) Same as Pole F fails open in the reset position.	a) Same as Pole F fails open in the reset position.	a) Same as Pole F fails open in the reset position.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None, assuming there has not been a prior failure which prevents using Bus A as the PCM Bus.	b) Same as for Pole F fails open in the reset position.	b) Ground switches to Bus A as the PCM Bus.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Bus Select Relay #6" (K3-308) (52-79703-61) (Continued)	L M S	a) Pole E fails open in the reset position.	a) There is a partial loss of control of power to the Exp 2 Rcdr. If the Rcdr Power Relays are latched, Rcdr will be powered-up whenever the Exp Rcdr Bus is powered-up. If the Rcdr Power Relays are reset, power is not supplied to the Exp 2 Rcdr when the ground attempts to use the Rcdr.	a) (1) When the crew switches the "EXP 2" switches to the "OFF" position, sounds emitted from the Rcdr indicate it is still running, i.e., if the Exp Rcdr Bus is still powered-up. The Exp 2 "RECORD" lights extinguish as expected. (2) If the end-of-tape is reached, the Exp 2 Rcdr "STOP" light comes ON.	a) (1) If Rcdr is powered-up when the failure occurs, when the ground powers down the Rcdr, R/T TM indicates the Exp 2 Rcdr continues to have tape motion (i.e., if the Exp Rcdr Bus is powered-up for the Exp 1 Rcdr) and that the dump "OFF" commands were correctly received and decoded by the DCS. (2) If Rcdr is powered-down when the failure occurs, data is not received when Rcdr is dumped. The Xmtr's carrier wave is received. When ground commands Exp 2 Rcdr record or dump, R/T TM indicates the dump commands are correctly received and decoded by the DCS, and that there is no tape motion for either record or dump commands.	a) N/A	—
		b) Insulating film on contacts due to contamination.	b) None, assuming there has not been a prior failure which prevents using Bus B as the PCM Bus.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test the "RECORD" lights on Panel 204.	b) Ground switches to Bus B as the PCM Bus.	b) IIIb	
	L M S	a) Pole E fails open in the latch position.	a) Same as Pole E fails open in the reset position.	a) Same as Pole E fails open in the reset position.	a) Same as Pole E fails open in the reset position.	a) N/A	—
		b) Insulating film on contacts due to contamination.	b) None, assuming there has not been a prior failure which prevents using Bus A as the PCM Bus.	b) Same as for Pole E fails open in the reset position.	b) Ground switches to be Bus A as the PCM Bus.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Bus Select Relay #6" (K3-308) (52-79703-61) (Continued)	L M S	a) Pole D dails open in the reset position.	a) There is a partial loss of control of power to the Exp 2 Rcdr. Power is not supplied to the Rcdr when the crew attempts to record Exp 2 data.	a) When the crew switches an Exp 2 switch to the "RECORD" position the Exp 2 "RECORD" lights do rot come ON.	a) When the ground dumps the Exp 2 Rcdr, they observe that no new data has been recorded since the previous dump. Recorded Data 2 (subframe 4) is not affected.	a) N/A	—
		b) Insulating film on contacts due to contamination.	b) None, assuming there has not been a prior failure which prevents using Bus B as the PCM Bus.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test the "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground switches to Bus B as the PCM Bus.	b) IIIb	
	L M S	a) Pole D fails open in the latch position.	a) Same as for Pole D fails open in the reset position.	a) Same as for Pole D fails open in the reset position.	a) Same as for Pole D fails open in the reset position.	a) N/A	—
		b) Insulating film on contacts due to contamination.	b) None, assuming there has not been a prior failure which prevents using Bus A as the PCM Bus.	b) Same as for Pole D fails open in the reset position.	b) Ground switches to Bus A as the PCM Bus.	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None.	a) None.	a) N/A	—
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Bus Select Relay #3" (K3-305) (52-79703-61) (Continued)	L M S	a) Pole C fails open in the reset position.	a) (1) When crew and ground remove all commands which require powering up the Data Recdr, the Power Relays for the Data Recdr do not reset. Power is applied to the Data Recdr whenever the PCM Bus is powered-up. (2) If Recdr is powered-down when the failure occurs, power is not supplied to the Recdr when ground attempts to dump the Recdr.	a) (1) When the crew powers down the Data Recdr, sounds emitted from the Recdr indicate it is still running, i.e., if the PCM Bus is still powered-up. The Data and/or Voice "RECORD" lights extinguish as expected. (2) If end-of-tape is reached, the Data Recdr "STOP" light (on Panel 204) comes ON.	a) (1) After ground powers down the Data Recdr, R/T TM indicates it has tape motion and that the commands were correctly received and decoded by the DCS. (2) If Recdr is powered-down when failure occurs, data and voice are not received when ground dumps the Recdrs. The Xmtrs' carrier waves are received. R/T TM indicates there is no tape motion, and that the dump commands were correctly received and decoded by the DCS.	a) N/A	—
		b) Insulating film on contacts due to contamination.	b) None, assuming there has not been a prior failure which prevents using Bus B as the PCM Bus.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test the "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground switches to Bus B as the PCM Bus	b) IIIb	
	L M S	a) Pole C fails open in the latch position.	a) Same as for Pole C fails open in the reset position.	a) Same as for Pole C fails open in the reset position.	a) Same as for Pole C fails open in the reset position.	a) N/A	—
		b) Insulating film on contacts due to contamination.	b) None, assuming there has not been a prior failure which prevents using Bus A as the PCM Bus.	b) Same as for Pole C fails open in the reset position.	b) Ground switches to Bus A as the PCM Bus.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Bus Select Relay #6" (K3-308) (52-79703-61) (Continued)	L M S	a) Pole B fails open in the reset position.	a) There is a partial loss of control of power to the Data Rcdr. Power is not supplied to the Rcdr when crew or ground attempts to record data or voice (crew controlled) on the Rcdr. Power is supplied to the Rcdr when ground attempts to dump the Rcdr.	a) When crew switches the "DATA" or a Voice Record switch to the "RECORD" position, their respective "RECORD" indicator lights do not come ON.	a) (1) When the ground attempts to record data on the Data Rcdr, R/T TM indicates there is no tape motion. (2) When the ground dumps the Data Rcdr, they observe that no new data has been recorded since the previous dump.	a) N/A	—
		b) Insulating film on contacts due to contamination.	b) None, provided there has not been a prior failure which prevents using Bus B as the PCM Bus.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test "RECORD" lights on Panel 204.	b) Ground switches to Bus B as the PCM Bus.	b) IIIb	
	L M S	a) Pole B fails open in the latch position.	a) Same as for Pole B fails open in the reset position.	a) Same as for Pole B fails open in the reset position.	a) Same as for Pole B fails open in the reset position.	a) N/A	—
		b) Insulating film on contacts due to contamination.	b) None, provided there has not been a prior failure which prevents using Bus A as the PCM Bus.	b) Same as for Pole B fails open in the reset position.	b) Ground switches to Bus A as the PCM Bus.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Bus Select Relay #6" (K3-308) (52-79703-61) (Continued)	L M S	a) Latch coil fails open.	a) When the ground gives the PCM Bus Select B command (S274), Relay K3-308 does not cycle to the latch position. Power is not supplied to the Exp 2 or Data Rcdrs when the crew or ground attempts to use them.	a) When the crew switches the "DATA" switch or a Voice switch or an "Exp 2" switch to the "RECORD" position, their respective "RECORD" lights do not come ON. Rcdrs do not sound like they are operating.	a) When ground attempts to use the Data Rcdr or the Exp 2 Rcdr for recording or dumping data, R/T TM indicates there is no tape motion and that Bus A and/or Bus B are powered-up.	a) N/A	-
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None, provided there has not been a prior failure which prevents using Bus A as the PCM Bus.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground switches to Bus A as the PCM Bus.	b) IIIb	
	L M S	a) Reset coil fails open.	a) When ground gives the PCM Bus Select A command (S275), Relay K3-308 does not cycle to the reset position. Power is not supplied to the Exp 2 or Data Rcdrs when the crew or ground attempts to use them.	a) Same as for the latch coil fails open.	a) Same as for the latch coil fails open.	a) N/A	-
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None, provided there has not been a prior failure which prevents using Bus B as the PCM Bus.	b) Same as for the latch coil fails open.	b) Ground switches to Bus B as the PCM Bus.	b) IIIb	

DATE 31 August 1971
REVISED
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SYSTEM: INSTRUMENTATION
SUBSYSTEM: RECORDER POWER CONTROL

MCDONNELL
ST. LOUIS, MISSOURI

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
3.9.04 (Unassigned ident number)							

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Bus Select Relay #11" (K3-367) (52-79703-61) 3.9.05	L M S	a) (1) Pole F fails open in the reset position, or (2) Pole D fails open in the latch position.	a) When the crew and ground remove all commands which require that Rcdr #1 be powered-up, the Power Relays for the Rcdr do not reset. Power is applied to Rcdr #1 whenever Bus A is powered-up.	a) (1) When the crew switches Rcdr #1 related switches to the "OFF" position, sounds emitted from the Rcdr indicate it is still running, i.e. provided Bus A is still powered-up. The related "RECORD" lights extinguish as expected. (2) If the end-of-tape is reached, the Rcdr #1 "STOP" light comes ON.	a) (1) After ground powers down Rcdr #1, R/T TM indicates it still has tape motion (i.e. provided its bus is still powered-up) and that dump OFF commands were correctly received and decoded by the DCS.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None, assuming there has not been a prior failure which prevents using the other Bus as the PCM Bus.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) (1) For Pole F failure, ground switches to Bus B as the PCM Bus. (2) For Pole D failure, ground switches to Bus A as the PCM Bus.	b) IIIb	
		a) (1) Pole F fails open in the latch position, or (2) Pole D fails open in the reset position.	a) When the crew and ground remove all commands which require that Rcdr #1 be powered-up, the Power Relays for the Rcdr do not reset. Power is applied to Rcdr #1 whenever Bus B is powered-up.	a) (1) When the crew switches Rcdr #1 related switches to the "OFF" position, sounds emitted from the Rcdr indicate it is still running, i.e. provided Bus B is still powered-up. The related "RECORD" lights extinguish as expected. (2) If the end-of-tape is reached, the Rcdr #1 "STOP" light comes ON.	a) (1) After ground powers down Rcdr #1, R/T TM indicates it still has tape motion (i.e. provided its bus is still powered-up) and that dump OFF commands were correctly received and decoded by the DCS.	a) N/A	----

(Continued next page)

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Bus Select Relay #11" (K3-367) (52-79703-61) 3.9.05 (Continued)		b) Insulating film on contacts due to contamination.	b) None, assuming there has not been a prior failure which prevents using the other Bus as the PCM Bus.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) (1) For the Pole F failure, ground switches to Bus A as the PCM Bus. (2) For the Pole D failure, ground switches to Bus B as the PCM Bus.	b) IIIb	
	L M S	a) (1) Pole E fails open in the reset position, or (2) Pole C fails open in the latch position.	a) Power is not supplied to Rcdr #1 when the crew or ground attempts to use the Rcdr.	a) When the crew switches the Rcdr #1 related switch to the "RECORD" position, the related "RECORD" light does not come ON. Rcdr does not sound like it is running.	a) When the ground attempts to use Rcdr #1 for recording or dumping data, R/T TM indicates there is no tape motion.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None, provided there has been no prior failure which prevents switching to the other Bus as the PCM Bus.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) (1) For the Pole E failure, ground switches to Bus B as the PCM Bus. (2) For the Pole C failure, ground switches to Bus A as the PCM Bus.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Bus Select Relay #11" (K3-367) (52-79703-61) (Continued)	L M S	a)(1) Pole E fails open in the latch position or (2) Pole C fails open in the reset position	a) Power is not supplied to Rcdr #1 when the crew or ground attempts to use the Rcdr.	a) When the crew switches the Rcdr #1 related switch to the "RECORD" position, the related "RECORD" light does not come ON. Rcdr does not sound like it is running.	a) When the ground attempts to use the Rcdr #1 for recording or dumping data, R/T TM indicates there is no tape motion.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None, provided there has been no prior failure which prevents switching to other Bus as the PCM Bus.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test "RECORD" lights on Panel #04. (3) Crew informs the ground of the anomaly.	b) (1) For the Pole E failure, ground switches to Bus A as the PCM Bus. (2) For the Pole C failure, ground switches to Bus B as the PCM Bus.	b) IIIb	
	L M S	a) Pole B fails open in the reset position.	a) There is a loss of control of power to the Exp 1 Rcdr. If the Rcdr Power Relays are latched, Rcdr will be powered-up whenever the Exp Rcdr Bus is powered-up. If the Rcdr Power Relays are reset, power is not supplied to the Exp 1 Rcdr when the crew or ground attempts to dump the Rcdr.	a) (1) When the crew switches the "EXP 1" switches to the "OFF" position, sounds emitted from the Rcdr indicate it is still running, i.e. if the Exp Rcdr Bus is still powered-up. The Exp 2 "RECORD" lights extinguish as expected. (2) If the end-of-tape is reached, the Exp Rcdr "STOP" light comes ON.	a) (1) If Rcdr is powered-up when the failure occurs, when the ground powers down the Rcdr, R/T TM indicates the Exp 1 Rcdr continues to have tape motion (i.e. if the Exp Rcdr Bus is powered-up for the Exp 2 Rcdr) and that the dump "OFF" commands were correctly received and decoded by the DCS. (2) If Rcdr is powered-down when the failure occurs, data is not received when Rcdr is dumped. The Xmtr's carrier wave is received. When ground commands Exp 1 Rcdr dump, R/T TM indicates the dump commands are correctly received and decoded by the DCS, and that there is no tape motion.	a) N/A	----
		(Continued next page)					

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Bus Select Relay #11" (K3-367) (52-79703-61) (Continued)		b) Insulating film on contacts due to contamination.	b) None, assuming there has not been a prior failure which prevents using Bus B as the PCM Bus.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test the "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground switches to Bus B as the PCM Bus.	b) IIIb	
	L M S	a) Pole B fails open in the latch position.	a) Same as Pole B fails open in the reset position.	a) Same as Pole B fails open in the reset position.	a) Same as Pole B fails open in the reset position.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None, assuming there has not been a prior failure which prevents using Bus A as the PCM Bus.	b) Same as for Pole B fails open in the reset position.	b) Ground switches to Bus A as the PCM Bus.	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Bus Select Relay #11" (K3-367) (52-79703-61) (Continued)	L M S	a) Latch coil fails open.	a) If the ground gives the PCM Bus Select B command (S274), Relay K3-367 does not cycle to the latch position. Depending upon the Recdr data assignments, the effect is as follows: (1) With the S155/S171 or S155/S170 commands in effect, the Data Recdr will receive power only if one of the Exp Recdrs is powered-up. All three Recdrs will use Exp Recdr Bus power but relay logic prevents more than two Recdrs being powered from one Conv. (2) With the S154/S171 or S154/S170 commands in effect, the Exp 1 Recdr is powered from the PCM Bus. This will cause a slight overload on the PCM Bus with two Recdrs on the bus. Tests indicate that Conv will operate within spec with a 30% overload on the +24 VDC output and will not be damaged.	a) (1) When the ground attempts to record Data or Voice, the respective "Record" lights do not come ON unless the Exp Recdr Bus is powered-up with only one of the Exp Recdrs operating. (2) None in the S154/S171 or S154/S170 configuration.	a) (1) Ground does not receive data or voice from the Data Recdr unless one of the Exp Recdrs is operating. R/T TM indicates the Data Recdr has no tape motion unless one of the Exp Recdrs is operating. (2) With the S154/S171 or S154/S170 commands, ground observes a slight depression on the +24 VDC Bus B voltage monitor (M520) whenever the Exp 1 Recdr turn ON. Voltage returns to normal when the Recdr gets up to speed. Temperature of PCM Bus Conv may increase slightly due to the overload.	a) N/A	- - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None, assuming there has not been a prior failure which prevents using Bus A as the PCM Bus.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "Lighting Status" switch to test the "Record" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground switches to Bus A as the PCM Bus.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Bus Select Relay #11" (K3-367) (52-79703-61) (Continued)	L M S	a) Reset coil fails open.	a) If the ground gives the PCM Bus Select A command (S275), Relay K3-367 does not cycle to the reset position. Depending upon the Rcdr data assignments, the effects is as follows: (1) With the S155/S171 or S155/S170 commands in effect, the Data Rcdr will receive power only if one of the Exp Rcdrs is powered-up. All three Rcdrs will use Exp Rcdr Bus power but relay logic prevents more than two Rcdrs being powered from one Conv. (2) With the S154/S171 or S154/S170 commands in effect, the Exp 1 Rcdr is powered from the PCM Bus. This will cause a slight overload on the PCM Bus with two Rcdrs on the bus. Tests indicate that Conv will operate within spec with a 30% overload on the +24 VDC output and will not be damaged.	a) (1) When the ground attempts to record Data or Voice, the respective "RECORD" lights do not come ON unless the Exp Rcdr Bus is powered-up with only one of the Exp Rcdrs operating. (2) None in the S154/S171 or S154/S170 commands.	a) (1) Ground does not receive data or voice from the Data Rcdr unless one of the Exp Rcdrs is operating. R/T TM indicates the Data Rcdr has no tape motion unless one of the Exp Rcdrs is operating. (2) With the S154/S171 or S154/S170 commands, ground observes a slight depression on the +24 VDC Bus B voltage monitor (M520) whenever the Exp 1 Rcdr turns ON. Voltage returns to normal when the Rcdr gets up to speed. Temperature of PCM Bus Conv may increase slightly to the overload.	a) N/A	- - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None, assuming there has not been a prior failure which prevents using Bus B as the PCM Bus.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "Lighting Status" switch to test the "Record" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground switches to Bus B as the PCM Bus.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Bus Select Relay #12" (K3-368) (52-79703-61) 3.9.25	L M S	a) (1) Pole F fails open in the reset position, or (2) Pole C fails open in the latch position.	a) When the crew and ground remove all commands which require that Rcdr #2 be powered-up, the Power Relays for the Rcdr do not reset. Power is applied to Rcdr #2 whenever Bus A is powered-up.	a) (1) When the crew switches Rcdr #2 related switches to the "OFF" position, sounds emitted from the Rcdr indicate it is still running, i.e. provided Bus A is still powered-up. The related "RECORD" lights extinguish as expected. (2) If the end-of-tape is reached, the Rcdr #2 "STOP" light comes ON.	a) (1) After ground powers down Rcdr #2, R/T TM indicates it still has tape motion (i.e. provided its bus is still powered-up) and that dump OFF commands were correctly received and decoded by the DCS.	a) N/A	-
		b) Insulating film on contacts due to contamination.	b) None, assuming there has not been a prior failure which prevents using the other Bus as the PCM Bus.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly	b) (1) For Pole F failure, ground switches to Bus B as the PCM Bus. (2) For Pole C failure, ground switches to Bus A as the PCM Bus.	b) IIIb	
	L M S	a) (1) Pole F fails open in the latch position or (2) Pole C fails open in the reset position.	a) When the crew and ground remove all commands which require that Rcdr #2 be powered-up, the Power Relays for the Rcdr do not reset. Power is applied to Rcdr #2 whenever Bus B is powered-up.	a) (1) When the crew switches Rcdr #2 related switches to the "OFF" position, sounds emitted from the Rcdr indicate it is still running, i.e. provided Bus B is still powered-up. The related "RECORD" lights extinguish as expected. (2) If the end-of-tape is reached, the Rcdr #2 "STOP" light comes ON.	a) (1) After ground powers down the Rcdr #2, R/T TM indicates it still has tape motion (i.e. provided its bus is still powered-up) and that dump OFF commands were correctly received and decoded by the DCS.	a) N/A	-
		b) Insulating film on contacts due to contamination.	b) None, assuming there has not been a prior failure which prevents using the other Bus as the PCM Bus.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) (1) For Pole F failure ground switches to Bus A as the PCM Bus. (2) For Pole C failure, ground switches to Bus B as the PCM Bus.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Bus Select Relay #12" (K3-368) (52-79703-61) (Continued)	L M S	a) (1) Pole E fails open in the reset position or (2) Pole D fails open in the latch position.	a) Power is not supplied to Rcdr #2 when the crew or ground attempts to use the Rcdr.	a) When the crew switches the Rcdr #2 related switch to the "RECORD" position, the related "RECORD" light does not come ON. Rcdr does not sound like it is running.	a) When the ground attempts to use Rcdr #2 for recording or dumping data, R/T TM indicates there is no tape motion.	a) N/A	-
		b) Insulating film on contacts due to contamination.	b) None, provided there has been no prior failure which prevents switching to the other Bus as the PCM Bus.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test "RECORD" lights on Panel 204.	b) (1) For the Pole E failure, ground switches to Bus B as the PCM Bus. (2) For the Pole D failure, ground switches to Bus A as the PCM Bus.	b) IIIb	
	L M S	a) (1) Pole D fails open in the reset position or (2) Pole E fails open in the latch position.	a) Power is not supplied to Rcdr #2 when the crew or ground attempts to use the Rcdr.	a) When the crew switches the Rcdr #2 related switch to the "RECORD" position, the related "RECORD" light does not come ON. Rcdr does not sound like it is running.	a) When the ground attempts to use Rcdr #2 for recording or dumping data, R/T TM indicates there is no tape motion.	a) N/A	-
		b) Insulating film on contacts due to contamination.	b) None, provided there has been no prior failure which prevents switching to the other Bus as the PCM Bus.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) (1) For the Pole D failure ground switches to Bus B as the PCM Bus. (2) For the Pole E failure, ground switches to Bus A as the PCM Bus.	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position	a) None - GSE use only.	a) None	a) None	a) N/A	-
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching "PCM Bus Select Relay #12" (K3-368) (52-79703-61) (Continued)	M	a) Pole B fails open in the reset position.	a) When the crew attempts to record Exp. 1 data, power is not supplied to the Rcdr. Dumping of the Rcdr is not affected.	a) When the crew switches an "EXP 1" switch to the "RECORD" position, the Exp 1 "RECORD" lights do not come ON. The Rcdr does not sound like it is running.	a) When the ground dumps the Exp 1 Rcdr, they observe that no new data has been recorded since the previous dump.	a) N/A	-
		b) Insulating film on contacts due to contamination.	b) None, assuming there has not been a prior failure which prevents using Bus B as the PCM Bus.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test the "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground switches to Bus B as the PCM Bus.	b) IIIb	
	M	a) Pole B fails open in the latch position.	a) When the crew attempts to record Exp. 1 data, power is not supplied to the Rcdr. Dumping of the Rcdr is not affected.	a) When the crew switches an "EXP 1" switch to the "RECORD" position, the Exp 1 "RECORD" lights do not come ON. The Rcdr does not sound like it is running.	a) When the ground dumps the Exp 1 Rcdr, they observe that no new data has been recorded since the previous dump.	a) N/A	-
		b) Insulating film on contacts due to contamination.	b) None, assuming there has not been a prior failure which prevents using Bus A as the PCM Bus.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test the "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground switches to Bus A as the PCM Bus.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Bus Select Relay #12" (K3-368) (52-79703-61) (Continued)	L M S	a) Latch coil fails open.	a) If the ground gives the PCM Bus Select B command (S274), Relay K3-368 does not cycle to the latch position. Depending on the Rcdr data assignments, the effect is as follows: (1) With S155/S171 command in effect, the Exp 1 Rcdr is powered from the PCM Bus. With the S155/S170 or S154/S170 command in effect, the Exp 2 Rcdr is powered from the PCM Bus. This will cause a slight overload on the PCM Bus with two Rcdrs on the bus. Tests indicate that Conv will operate within spec with a 30% overload on the +24 VDC output and will not be damaged. (2) With the S154/S171 commands in effect, the Data Rcdr will receive power only if one of the Exp Rcdrs is powered-up. All three Rcdrs will use Exp Rcdr Bus power but relay logic prevents more than two Rcdrs being powered from one Conv.	a) (1) None in the S155/S171, S154/S170 or S155/S170 configuration. (2) In the S154/S171 configuration, when the ground attempts to record Data or Voice, the respective "RECORD" lights do not come ON unless the Exp Rcdr Bus is powered-up with only one of the Exp Rcdrs operating.	a) (1) With the S155/S171 command in effect, ground observes that the Exp 1 Rcdr will not dump data unless the PCM Bus is powered-up. (2) In the S155/S170 or S154/S170 configuration, ground observes that the Exp 2 Rcdr will not dump data unless the PCM Bus is powered-up. (3) In the S154/S171 configuration, ground does not receive data or voice from the Data Rcdr unless one of the Exp Rcdrs is powered-up. R/T TM indicates the Data Rcdr has no tape motion unless one of the Exp Rcdrs is operating.	a) N/A	- - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None, assuming there has not been a prior failure which prevents using Bus A as the PCM Bus.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause anomaly. (2) Crew uses "Lighting Status" switch to test the "Record" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground switches to Bus A as the PCMBus.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Bus Select Relay #12" (KD-368) (52-79703-61) (Continued)	L M S	a) Reset coil fails open.	a) If the ground gives the PCM Bus Select A command (S275), Relay K3-368 does not cycle to the reset position. Depending on the Rcdr data assignments, the effect is as follows: (1) With S155/S171 command in effect, the Exp 1 Rcdr is powered from the PCM Bus. With the S155/S170 or S154/S170 command in effect, the Exp 2 Rcdr is powered from the PCM Bus. This will cause a slight overload on the PCM Bus with two Rcdrs on the bus. Tests indicate that Conv will operate within spec with a 30% overload on the +24 VDC output and will not be damaged. (2) With the S154/S171 commands in effect, the Data Rcdr will receive power only if one of the Exp Rcdrs is powered-up. All three Rcdrs will use Exp Rcdr Bus power but relay logic prevents more than two Rcdrs being powered from one Conv.	a) (1) None in the S155/S171, S154/S170 or S155/S170 configuration. (2) In the S154/S171 configuration, when the ground attempts to record Data or Voice, the respective "RECORD" lights do not come ON unless the Exp Rcdr Bus is powered-up with only one of the Exp Rcdrs operating.	a) (1) With the S155/S171 command in effect, ground observes that the Exp 1 Rcdr will not dump data unless the PCM Bus is powered-up. (2) In the S155/S170 or S154/S170 configuration, ground observes that the Exp 2 Rcdr will not dump data unless the PCM Bus is powered-up. (3) In the S154/S171 configuration, ground does not receive data or voice from the Data Rcdr unless one of the Exp Rcdrs is powered-up. R/T TM indicates the Data Rcdr has no tape motion unless one of the Exp Rcdrs is operating.	a) N/A	- - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None, assuming there has not been a prior failure which prevents using Bus B as the PCM Bus.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "Lighting Status" switch to test the "Record" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground switches to Bus B as the PCM Bus.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Bus Select Relay #13" (K3-369) (52-79703-61) 3.9.07	L M S	a) (1) Pole F fails open in the reset position, or (2) Pole C fails open in the latch position.	a) When the crew and ground remove all commands which require that Rcdr #3 be powered-up, the Power Relays for the Rcdr do not reset. Power is applied to Rcdr #3 whenever Bus A Bus is powered-up.	a) (1) When the crew switches Rcdr #3 related switches to the "OFF" position, sounds emitted from the Rcdr indicate it is still running, i.e. provided Bus A is still powered-up. The related "RECORD" lights extinguish as expected. (2) If the end-of-tape is reached, the Rcdr #3 "STOP" light comes ON.	a) (1) After ground powers down the Rcdr #3, R/T TM indicates it still has tape motion (i.e. provided its bus is still powered-up) and that dump OFF commands were correctly received and decoded by the DCS.	a) N/A	-
		b) Insulating film on contacts due to contamination.	b) None, assuming there has not been a prior failure which prevents using the other Bus as the PCM Bus.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) (1) For the Pole F failure ground switches to Bus B as the PCM Bus. (2) For the Pole C failure, ground switches to Bus A as the PCM Bus.	b) IIIb	
	L M S	a) (1) Pole C fails open in the reset position or (2) Pole F fails open in the latch position.	a) When the crew and ground remove all commands which require that Rcdr #3 be powered-up, the Power Relays for the Rcdr do not reset. Power is applied to Rcdr #3 Rcdr whenever Bus B is powered-up.	a) (1) When the crew switches Rcdr #3 related switches to the "OFF" position, sounds emitted from the Rcdr indicate it is still running, i.e. provided Bus B is still powered-up. The related "RECORD" lights extinguish as expected. (2) If the end-of-tape is reached, the Rcdr #3, "STOP" light comes ON.	a) (1) After ground powers down the Rcdr #3, R/T TM indicates it still has tape motion (i.e. provided its bus is still powered-up) and that dump OFF commands were correctly received and decoded by the DCS.	a) N/A	-
		b) Insulating film on contacts due to contamination.	b) None, assuming there has not been a prior failure which prevents using the other Bus as the PCM Bus.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) (1) For the Pole C failure, ground switches to Bus B as the PCM Bus. (2) For the Pole F failure, ground switches to Bus A as the PCM Bus.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Bus Select Relay #13" (K3-369) (52-79703-61) (Continued)	L M S	a) (1) Pole E fails open in the reset position or (2) Pole D fails open in the latch position.	a) Power is not supplied to Rcdr #3 when the crew or ground attempts to use the Rcdr.	a) When the crew switches the Rcdr #3 related switch to the "RECORD" position, the related "RECORD" light does not come ON. Rcdr does not sound like it is running.	a) When the ground attempts to use Rcdr #3 for recording or dumping data, R/T TM indicates there is no tape motion.	a) N/A	-
		b) Insulating film on contacts due to contamination.	b) None, provided there has been no prior failure which prevents switching to the other Bus as the PCM Bus.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) (1) For the Pole E failure, ground switches to Bus B as the PCM Bus. (2) For the Pole D failure, ground switches to Bus A as the PCM Bus.	b) IIIb	
	L M D	a) (1) Pole D fails open in the reset position or (2) Pole E fails open in the latch position	a) Power is not supplied to Rcdr #3 when the crew or ground attempts to use the Rcdr.	a) When the crew switches the Rcdr #3 related switch to the "RECORD" position, the related "RECORD" light does not come ON. Rcdr does not sound like it is running.	a) When the ground attempts to use Rcdr #3 for recording or dumping data, R/T TM indicates there is no tape motion.	a) N/A	-
		b) Insulating film on contacts due to contamination.	b) None, provided there has been no prior failure which prevents switching to the other Bus as the PCM Bus.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) (1) For the Pole D failure, ground switches to Bus B as the PCM Bus. (2) For the Pole E failure, ground switches to Bus A as the PCM Bus.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Bus Select Relay #13" (K3-369) (52-79703-61) (Continued)	L M S	a) Latch coil fails open.	a) If the ground gives the PCM Bus Select B command (S274), Relay K3-369 does not cycle to the latch position. Depending on the Rcdr data assignments, the effect is as follows: (1) With S155/S170 command in effect, the Exp 1 Rcdr is powered from the PCM Bus. With the S155/S171 or S154/S171 command in effect, the Exp 2 Rcdr is powered from the PCM Bus. This will cause a slight overload on the PCM Bus with two Rcdrs on the bus. Tests indicate that Conv will operate within spec with a 30% overload on the +24 VDC output and will not be damaged. (2) With the S154/S170 commands in effect, the Data Rcdr will receive power only if one of the Exp Rcdrs is powered-up. All three Rcdrs will use Exp Rcdr Bus power but relay logic prevents more than two Rcdrs being powered from one Conv.	a) (1) None in the S155/S171, S154/S171 or S155/S170 configuration. (2) In the S154/S170 configuration, when the ground attempts to record Data or Voice, the respective "RECORD" lights do not come ON unless the Exp Rcdr Bus is powered-up with only one of the Exp Rcdrs operating.	a) (1) With the S155/S170 command in effect, ground observes that the Exp 1 Rcdr will not dump data unless the PCM Bus is powered-up. (2) In the S155/S171 or S154/S171 configuration ground observes that the Exp 2 Rcdr will not dump data unless the PCM Bus is powered-up. (3) In the S154/S170 configuration, ground does not receive data or voice from the Data Rcdr unless one of the Exp Rcdrs is powered-up. R/T TM indicates the Data Rcdr has no tape motion unless one of the Exp Rcdrs is operating.	a) N/A	---
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None, assuming there has not been a prior failure which prevents using Bus A as the PCM Bus.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test the "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground switches to Bus A as the PCM Bus.	a) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, PCM Bus Select Relay "13" (K3-369) (52-79703-61) (Continued)	L M S	a) Reset coil fails open.	a) If the ground gives the PCM Bus Select A command (S275), Relay K3-369 does not cycle to the reset position. Depending on the Rcdr data assignments, the effect is as follows: (1) With S155/S170 command in effect, the Exp 1 Rcdr is powered from the PCM Bus. With the S155/S171 or S154/S191 command in effect, the Exp 2 Rcdr is powered from the PCM Bus. This will cause a slight overload on the bus. Tests indicate that Conv will operate within spec with a 30% overload on the +24 VDC output and will not be damaged. (2) With the S154/S170 commands in effect, the Data Rcdr will receive power only if one of the Exp Rcdrs is powered-up. All three Rcdrs will use Exp Rcdrs Bus power but relay logic prevents more than two Rcdrs being powered from one Conv.	a) (1) None in the S155/S171, S154/S171 or S155/S170 configuration. (2) In the S154/S170 configuration, when the ground attempts to record Data or Voice, the respective "RECORD" lights do not come ON unless the Exp Rcdr Bus is powered-up with only one of the Exp Rcdrs operating.	a) (1) With the S155/S170 command in effect, ground observes that the Exp 1 Rcdr will not dump data unless the PCM Bus is powered-up. (2) In the S155/S171 or S154/S171 configuration, ground observes that the Exp 2 Rcdr will not dump data unless the PCM Bus is powered-up. (3) In the S154/S170 configuration, ground does not receive data or voice from the Data Rcdr unless one of the Exp Rcdrs is powered-up. R/T TM indicates the Data Rcdr has no tape motion unless one of the Exp Rcdrs is operating.	a) N/A	- - - - - - - - - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None, assuming there has not been a prior failure which prevents using Bus B as the PCM Bus.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" to test the "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground switches to Bus B as the PCM Bus.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Bus Select Relay #13" (K3-369) (52-79703-61) (Continued)	L M S	a) Pole A or Pole B fails open in the reset or latch position. b) Insulating film on contacts due to contamination.	a) None - Pole A used for GSE only and Pole B is a spare. b) None	a) None b) None	a) None b) None	a) N/A b) IIIb	-

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
ARH - 50, 125 ohm Wirewound Resistor 30 Watt Rating 3.9.08 3.9.37 Any one of two	L M S	a) Resistor fails open.	a) Loss of the +24 VDC Bus B (or Bus A) dummy load resistor. This may result in a slight loss of regulation of the Bus B (or Bus A) Converters +5 VDC output if the +24 volt load is very small. Loss of regulation is not enough to damage any equipment.	a) None	a) TM may show a slight loss of regulation of the affected Conv's +5 volt output if the load on the affected Conv's +24 volt output is approximately 2% or less of the full load output (40 watts).	a) N/A	- - - - - - - - - -
		b) Mechanical or thermal stress.	b) None	b) None	b) Ground can switch one or both of the Transducer Groups to the affected Bus to increase the load on the +24 volt output of the affected Conv. NOTE: The Transducer Groups are normally powered from the PCM Bus.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder #1 Bus A Power Relay #1" (K3-342) (52-79703-53) 3.9.09	M	a) Pole E fails open in the reset position.	a) If Rcdr 2 and 3 are both configured for Bus A power and Rcdr #3 is powered-up, Rcdr #2 cannot be powered-up. Power to Rcdr #2 is not affected if Rcdr #3 is powered-up after Rcdr #2 has been powered-up.	a) (1) With Rcdr #3 powered-up, the "RECORD" light(s) related to Rcdr #2 data assignment do not come ON when the crew attempts to record that data assigned to Rcdr #2. (2) "RECORD" lights function normally if Rcdr #2 is powered-up before Rcdr #3 is powered-up.	a) (1) With Rcdr #3 powered-up data or data and voice are not received when ground dumps Rcdr #2. Only the carrier wave is received from the Xmtr(s). If R/T TM is ON, ground observes Rcdr #[illegible] o tape motion (2) With Rc[illegible]3 powered-up, when g[illegible] attempts to record [illegible] Rcdr #2, R/T TM [illegible]ates Rcdr #2 does no[illegible] tape motion. (3) Groun[illegible] that Rcdr [illegible] is not affecte[illegible] Rcdr #3 is powered down when Rcdr #2 is turned ON.	a) N/A	-
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch to test the "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground reconfigures the Rcdrs so that Rcdr #2 is powered from Bus B or requests that the crew manually do the same.	b) IIIb	
	L M S	a) Pole C fails open in the reset position.	a) None - Pole C is not functional in the reset position.	a) None	a) None	a) N/A	-
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole D or Pole E or Pole F fails open in the latch position.	a) None - These Poles are not functional in the latch position.	a) None	a) None	a) N/A	-
		b) Insulating film on contacts due to contamination	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder #1 Bus A Power Relay #1" (K3-342) (52-79703-53) (Continued)	M	a) Pole D fails open in the reset position.	a) If Rcdr 2 and 3 are both configured for Bus A power and Rcdr #2 is powered-up, Rcdr #3 cannot be powered-up. Power to Rcdr #3 is not affected if Rcdr #2 is powered-up after Rcdr #3 has been powered-up.	a) (1) With Rcdr #2 powered-up, the "RECORD" light(s) related to Rcdr #3 data assignment do not come ON when the crew attempts to record that data assigned to Rcdr #3. (2) "RECORD" lights function normally if Rcdr #3 is powered-up before Rcdr #2 is powered-up.	a) (1) With Rcdr #2 powered-up, data or data and voice are not received when ground dumps Rcdr #3. Only the carrier wave is received from the Xmtr(s). If R/T TM is ON, ground observes Rcdr #3 has no tape motion (2) With Rcdr #2 powered-up, when ground attempts to record data on Rcdr #3, R/T TM indicates Rcdr #3 does not have tape motion. (3) Ground observes that Rcdr #3 power is not affected if Rcdr #2 is powered down when Rcdr #3 is turned ON.	a) N/A	-
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch to test the "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground reconfigures the Rcdrs so that Rcdr #3 is powered from Bus B or requests that the crew manually do the same.	b) IIIb	
	L M S	a) Pole B fails open in the reset or latch position.	a) None - Redundancy on Pole B of Relay K3-343.	a) None	a) None	a) N/A	-
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	b) None	b) None	b) None	b) IIIb	
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder #1 Bus A Power Relay #1" (K3-342) (52-79703-53) (Continued)	L M S	a) (1) Pole C fails open in the latch position, or (2) Latch coil fails open.	a) If Rcdr #1 is configured for Bus A power, the "RECORD" light(s) related to the Rcdr's data assignment do not come ON when the crew attempts to record data assigned to the Rcdr.	a) (1) Data or data and voice are not received when the ground dumps Rcdr #1. Only the carrier wave is received from the Xmtr(s). R/T TM indicates there is no tape motion. (2) When ground attempts to record data on Rcdr #1, R/T TM indicates no tape motion.	a) (1) Data or data and voice are not received when the ground dumps Rcdr #1. Only the carrier wave is received from the Xmtr(s). R/T TM indicates there is no tape motion. (2) When ground attempts to record data on Rcdr #1, R/T TM indicates no tape motion.	a) N/A	
		b) (1) Insulating film on contacts due to contamination (2) Defective wire due to mechanical or thermal stress.	b) None. Rcdr #1 is switched to Bus B power.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch to test the "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground reconfigures the Rcdrs so that Rcdr #1 is powered from Bus B or requests that the crew manually do the same.	b) IIIb	
		a) Reset coil fails open. b) Insulating on contacts to cont... (Continued on next page)	a) Rcdr #1 will be powered-up whenever Bus A is powered-up.	a) (1) When crew commands Rcdr #1 OFF, sounds emitted from the Rcdr indicate it is still running, i.e. provided its bus is still powered-up. The "RECORD" indicator light(s) related to the function which has been switched OFF extinguish as expected. (2) If end-of-tape is reached, Rcdr #1 "STOP" light (on Panel 204) comes ON.	a) When ground commands Rcdr #1 OFF, R/T TM indicates it still has tape motion, i.e. provided its bus is still powered-up.	a) N/A	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder #1 Bus A Power Relay #1" (K3-342) (52-79703-53) (Continued)		b) Defective wire or terminal due to mechanical or thermal stress.	b) Rcdr #1 may accumulate more operating time than desired but this can be kept within an acceptable amount with proper Bus/Rcdr assignments.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground uses the PCM Bus Select B command (S274) so that Bus A is the Exp Rcdr Bus and then switches Rcdr #1 to be the Exp. 1 (or Exp. 2) Rcdr or requests that the crew manually select the desired Rcdr data assignments. This reduces the time that the Rcdr will be powered-up. NOTE: DCS cannot assign Exp 2 data to Rcdr #1.		
	L M S	a) Pole F fails open in the reset position.	a) Rcdr #1 cannot be powered from Bus B.	a) If Rcdr #1 is configured for Bus B power, the "RECORD" light(s) related to Rcdr #1 do not come ON when crew attempts to record data on Rcdr #1.	a) (1) Data or data and voice are not received when ground dumps Rcdr #1. Only the carrier wave is received from the Xmtr(s). R/T TM indicates there is no tape motion.	a) N/A	
		b) Insulating film on contacts due to contamination.	b) None. Rcdr #1 is switched to Bus A power.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch to test the "RECORD" lights on Panel 204. (3) Crew informs ground of the anomaly.	b) Ground reconfigures the Rcdrs so that Rcdr #1 is powered from Bus A or requests that the crew manually do the same.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder #1 Bus A Power Relay #2" (K3-343) (52-79703-61) 3.9.10	L M S	a) Pole F or Pole E or Pole D fails open in the reset or latch position.	a) None - These poles are spares.	a) None	a) None	a) N/A	-
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole C fails open in the latch position.	a) None - Not functional in the latch position.	a) None	a) None	a) N/A	-
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole B fails open in the reset or latch position.	a) None - Redundancy on Pole B of Relay K3-342.	a) None	a) None	a) N/A	-
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	-
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) (1) Pole C fails open in the reset position. (2) Reset coil fails open.	a) Loss of the dummy load (ARH-50, 125 ohm resistor) for the +24 VDC Bus A. This may result in a slight loss of regulation of the Bus A Converter's +5 VDC output if the +24 volt load is small enough. Loss of regulation is not enough to damage any equipment.	a) None	a) R/T TM may show a slight loss of regulation of the Bus A Converter's +5 VDC output if load on +24 volt output is approximately 2% or less of full load output (40 watts).		

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder #1 Bus A Power Relay #2" (K3-343) (52-79703-61) (Continued)		b) (1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) None	b) None	b) Ground can switch one or both of the Transducer Groups to Bus A to increase the load.	b) IIIb	
	L M S	a) Latch coil fails open.	a) When Recorder #1 is powered from Bus A, the dummy load (ARH-50, 125 ohm resistor) is not removed from Bus A. This results in approximately 4.8 watts additional load on the +24 volt output of the Conv. Total power requirement will not exceed the Converter's capability. If another Rcdr is also powered from Bus A, power is removed from the dummy load.	a) None	a) None	a) N/A	
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "Recorder #1 Bus A Power Relay #3" (K3-344) (52-79715-13)	L M S	a) (1) Pole A fails open when coil is energized, or (2) Coil fails open.	a) Rcdr #1 cannot be powered from Bus A.	a) If Rcdr #1 is configured for Bus A power, the "RECORD" light(s) related to the Rcdr's data assignment do not come ON when the crew attempts to record data assigned to the Rcdr.	a) (1) Data or Data and Voice are not received when the ground dumps Rcdr #1. Only the carrier wave is received from the Xmtr(s). R/T TM indicates there is no tape motion. (2) When ground attempts to record data on Rcdr #1, R/T TM indicates no tape motion.	a) N/A	----
		b) (1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) None. Rcdr #1 is switched to Bus B power.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch to test the "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground reconfigures the Rcdrs so that Rcdr #1 is powered from Bus B, or requests that the crew manually do the same.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "Recorder #1 Bus A Power Relay #3" (K3-3/4) (52-79715-13) (Continued)	L M S	a) (1) Pole B fails open when coil is energized, or (2) Coil fails open.	a) Rcdr #1 will be powered-up whenever Bus A is powered-up. There is also a loss of the +24 VDC Bus A dummy load. This is not a problem.	a) (1) When crew commands Rcdr #1 OFF, sounds emitted from the Rcdr indicate it is still running, i.e. provided its bus is still powered-up. The "RECORD" indicator light(s) related to the function which has been switched "OFF" extinguish as expected. (2) If end-of-tape is reached, Rcdr #1 "STOP" light (on Panel 204) comes ON.	a) When ground commands Rcdr #1 OFF, R/T TM indicates it still has tape motion, i.e. provided its bus is still powered-up.	a) N/A	---
		b) (1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) Rcdr #1 may accumulate more operating time than desired but this can be kept within an acceptable amount with proper Bus/Rcdr assignments.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground uses the PCM Bus Select B command (S274) so that Bus A is the Exp Rcdr and then switches Rcdr #1 to be the Exp 1 Rcdr or requests that the crew manually select the desired Rcdr data assignments. This reduces the time that the Rcdr will be powered-up.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW c) INDICATION d) ACTION	GROUND e) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder #1 Bus B Power Relay #1" (K3-345) (52-79703-53) 3.9.12	M	a) Pole E fails open in the reset position.	a) If Redr 2 and 3 are both configured for Bus B power and Redr #3 is powered-up, Redr #2 cannot be powered-up. Power to Redr #2 is not affected if Redr #3 is powered-up after Redr #2 has been powered-up.	a) (1) With Redr #3 powered-up, the "RECORD" light(s) related to Redr #2 data assignment do not come ON when the crew attempts to record that data assigned to Redr #2. (2) "RECORD" lights function normally if Redr #2 is powered-up before Redr #3 is powered-up.	a) (1) With Redr #3 powered-up, data or data and voice are not received when ground dumps Redr #2. Only the carrier wave is received from the Xmtr(s). If R/T TM is ON, ground observes Redr #2 has no tape motion. (2) With Redr #3 powered-up. when ground attempts to record data on Redr #2, R/T TM indicates Redr #2 does not have tape motion. (3) Ground observes that Redr #2 power is not affected if Redr #3 is powered-down when Redr #2 is turned ON.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch to test the "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground reconfigures the Redrs so that Redr #2 is powered from Bus A or requests that the crew manually do the same.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Record #1 Bus B Power Relay #1" (K3-3⅛5) (52-79703-53) (Continued)	M	a) Pole D fails open in the reset position.	a) If Rcdr 2 and 3 are both configured for Bus B power and Rcdr #2 is powered-up, Rcdr #3 cannot be powered-up. Power to Rcdr #3 is not affected if Rcdr #2 is powered-up after Rcdr #3 has been powered-up.	a) (1) With Rcdr #2 powered-up, the "RECORD" light(s) related to Rcdr #3 data assignment do not come ON when the crew attempts to record that data assigned to Rcdr #3. (2) "RECORD" lights function normally if Rcdr #3 is powered-up before Rcdr #2 is powered-up.	a) (1) With Rcdr #2 powered-up, data or data and voice are not received when ground dumps Rcdr #3. Only the carrier wave is received from the Xmtr(s). If R/T TM is ON, ground observes Rcdr #3 has no tape motion. (2) With Rcdr #2 powered-up, when ground attempts to record data on Rcdr #3, R/T TM indicates Rcdr #3 does not have tape motion. (3) Ground observes that Rcdr #3 power is not affected if Rcdr #2 is powered-down when Rcdr #3 is turned ON.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch to test the "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground reconfigures the Rcdrs so that Rcdr #3 is powered from Bus A or requests that the crew manually do the same.	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder #1 Bus B Power Relay #1" (K3-345) (52-79703-53) (Continued)	L M S	a) Pole D or Pole E or Pole F fails open in the latch position.	a) None - These poles are not functional in the latch position.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole C fails open in the reset position.	a) None - Pole C is not functional in the reset position.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) (1) Pole C fails open in the latch position.	a) Rcdr #1 cannot be powered from Bus B.	a) If Rcdr #1 is configured for Bus B power, the "RECORD" light(s) related to the Rcdr's data assignment do not come ON when the crew attempts to record data assigned to the Rcdr.	a) (1) Data or data and voice are not received when the ground dumps Rcdr #1. Only the carrier wave is received from the Xmtr(s). R/T TM indicates there is no tape motion. (2) When ground attempts to record data on Rcdr #1, R/T TM indicates no tape motion.	a) N/A	----
		b) (1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) None. Rcdr #1 is switched to Bus A power.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch to test the "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground reconfigures the Rcdrs so that Rcdr #1 is powered from Bus A or requests that the crew manually do the same.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder #1 Bus B Power Relay #1" (K3-345) (52-79703-53) (Continued)	L M S	a) Pole F fails open in the reset position.	a) Rcdr #1 cannot be powered from Bus A.	a) If Rcdr #1 is configured for Bus A power, the "RECORD" light(s) related to the Rcdr's data assignment do not come ON when the crew attempts to record data assigned to the Rcdr.	a) (1) Data or data and voice are not received when the ground dumps Rcdr #1. Only the carrier wave is received from the Xmtr(s). R/T TM indicates there is no tape motion. (2) When ground attempts to record data on Rcdr #1, R/T TM indicates no tape motion.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Rcdr #1 is switched to Bus B power.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch to test the "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground reconfigures the Rcdrs so that Rcdr #1 is powered from Bus B or requests that the crew manually do the same.	b) IIIb	
	L M S	a) Pole B fails open in the reset or latch position.	a) None - Redundancy on Pole B of Relay K3-346.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder #1 Bus B Power Relay #1" (K3-345) (52-79703-61) (Continued)	L M S	a) Reset coil fails open.	a) Rcdr #1 will be powered-up whenever Bus B is powered-up.	a) (1) When the crew commands Rcdr #1 OFF, sounds emitted from the Rcdr indicate it is still running, i.e. provided its bus is still powered-up. The "RECORD" indicator light(s) related to the function which has been switched OFF extinguish as expected. (2) If end-of-tape is reached, Rcdr #1 "STOP" light (on Panel 204) comes ON.	a) When ground commands Rcdr #1 OFF, R/T TM indicates it still has tape motion, i.e. provided its bus is still powered-up.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) Rcdr #1 may accumulate more operating time than desired but this can be kept within an acceptable amount with proper Bus/Rcdr assignments.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground uses the PCM Bus Select A command (8275) so that Bus B is the Exp Rcdr Bus and then switches Rcdr #1 to be the Exp 1 (or Exp 2) Rcdr or requests that the crew manually select the desired Rcdr data assignments. This reduces the time that the Rcdr will be powered-up. Note- DCS cannot assign Exp 2 data to Rcdr #1.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, latching, "Recorder #1 Bus B Power Relay #2" (K3-346) (52-79703-61) 3.9.13	L M S	a) Pole D or Pole E or Pole F fails open in the reset or latch position.	a) None - These poles are spares.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) (1) Pole C fails open in the reset position, or (2) Reset coil fails open.	a) Loss of the dummy load (ARH-50, 125 ohm resistor) for the +24 VDC Bus B. This may result in a slight loss of regulation of the Bus B Converter's +5 VDC output if the +24 volt load is very small. Loss of regulation is not enough to damage any equipment.	a) None.	a) R/T TM may show a slight loss of regulation of the Bus B Converter's +5 VDC output if the load on the +24 volt output is approximately 2% or less of the full load output (40 watts).	a) N/A	----
		b) (1) Insulating film on contacts due to contamination (2) Defective wire or terminal due to mechanical or thermal stress.	b) None.	b) None.	b) Ground can switch one or both of the Transducer Groups to Bus B to increase the load on the +24 volt output of the Conv.	b) IIIb	
	L M S	a) Pole C fails open in the latch position.	a) None - Not functional.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder #1 Bus B Power Relay #2" (K3-346) (52-79703-61) 3.9.13 (Continued)		a) Pole B fails open in the reset or latch position.	a) None - Redundancy on Pole B of Relay K3-345.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
		a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Latch coil fails open.	a) When Recorder #1 is powered from Bus B, the dummy load (ARH-50, 125 ohm resistor) is not removed from Bus B. This results in approximately 4.8 watts additional load on the +24 volt output of the Conv. Total Power requirement will not exceed the Converter's capability. If another Rcdr is also powered from Bus B, power is removed from the dummy load.	a) None.	a) None.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "Recorder #1 Bus B Power Relay #3" (K3-347) (52-79703-61) 3.9.14		a) (1) Pole A fails open when coil is energized, or (2) Coil fails open.	a) Rcdr #1 cannot be powered from Bus B.	a) If Rcdr #1 is configured for Bus B power, the "RECORD" light(s) related to the Rcdr's data assignment do not come ON when the crew attempts to record data assigned to the Rcdr.	a) (1) Data or data and voice are not received when the ground dumps Rcdr #1. Only the carrier wave is received from the Xmtr(s). R/T TM indicates there is no tape motion. (2) When ground attempts to record data on Rcdr #1, R/T TM indicates no tape motion.	a) N/A	----
		b) (1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) None. Rcdr #1 is switched to Bus A power.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch to test the "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground reconfigures the Rcdrs so that Rcdr #1 is powered from Bus A or requests that the crew manually do the same.	b) IIIb	
		a) (1) Pole B fails open when coil is energized, or (2) Coil fails open. (Continued next page)	a) Rcdr #1 will be powered-up whenever Bus B is powered-up. Also, there is a loss of the dummy load (ARH-50, 125 ohm resistor) for the +24 VDC Bus B. This is not a problem.	a) (1) When crew commands Rcdr #1 OFF, sounds emitted from the Rcdr indicate it is still running, i.e. provided its bus is still powered-up. The "RECORD" indicator light(s) related to the function which has been switched OFF extinguish as expected. (2) If end-of-tape is reached, Rcdr #1 "STOP" light (on panel 204)comes ON.	a) When ground commands Rcdr #1 OFF, R/T TM indicates it still has tape motion, i.e. provided its bus is still powered-up.	a) N/A	----

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "Recorder #1 Bus B Power Relay #3" (K3-3#7) (52-79703-61) (Continued)		b) (1) Insulating film on contacts due to contamination. (2) Defective wire or therminal due to mechanical or thermal stress.	b) Rcdr #1 may accumulate more operating time than desired but this can be kept within an acceptable amount with proper Bus/Rcdr assignments.	b) (1) Crew checks the switches and circuit brenkers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground uses the PCM Bus Select A command (S275) so that Bus B is the Exp Rcdr Bus and then switches Rcdr #1 to be the Exp 1 Rcdr or requests that the crew manually select the desired Rcdr data assignments. This reduces [illegible] that the Rcdr will be powered-up.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder #2 Bus B Power Relay #1" (K3-353) (52-79703-53) 3.9.15	M	a) Pole F fails open in the reset position.	a) If Rcdrs 1 and 3 are both configured for Bus B power and Rcdr #3 is powered-up, Rcdr #1 cannot be turned ON. Power to Rcdr #1 is not affected if Rcdr #3 is powered-up after Rcdr #1 has been powered-up.	a) (1) With Rcdr #3 powered-up, the "RECORD" light(s) related to Rcdr #1 data assignment do not come ON when the crew attempts to record data assigned to Rcdr #1. (2) "RECORD" lights function normally if Rcdr #1 is powered-up before Rcdr #3 is powered-up.	a) (1) With Rcdr #3 powered-up, data or data and voice are not received when ground dumps Rcdr #1. Only the carrier wave is received from the Xmtr(s). (2) With Rcdr #3 powered-up, when ground attempts to record data on Rcdr #1, R/T TM indicates Rcdr #1 does not have tape motion. (3) Ground observes that Rcdr #1 power is not affected if Rcdr #3 is powered-down when Rcdr #1 is turned ON.	a) N/A	--------
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch to test the "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground reconfigures the Rcdrs so that Rcdr #1 is powered from Bus A or requests that the crew manually do the same.	b) IIIb	
	L M S	a) Pole E fails open in the reset position.	a) Rcdr #2 cannot be powered from Bus A.	a) If Rcdr #2 is configured for Bus A power, the "RECORD" light(s) related to the Rcdr's data assignment do not come ON when the crew attempts to record data assigned to the Rcdr.	a) (1) Data or data and voice are not received when the ground dumps Rcdr #2. Only the carrier wave is received from the Xmtr(s). R/T TM indicates there is no tape motion. (2) When ground attempts to record data on Rcdr #2, R/T TM indicates no tape motion.	a) N/A	--------

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder #2 Bus B Power Relay #1" (K3-353) (62-79703-53) (Continued)	L M S	b) Insulating film on contacts due to contamination.	b) None. Rcdr #2 is switched to Bus B power.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch to test the "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground reconfigures the Rcdrs so that Rcdr #2 is powered from Bus B or requests that the crew manually do the same.	b) IIIb	
	M	a) Pole D fails open in the reset position.	a) If Rcdrs 1 and 3 are both configured for Bus B power and Rcdr #1 is powered-up, Rcdr #3 cannot be powered-up. Power to Rcdr #3 is not affected if Rcdr #1 is powered-up after Rcdr #3 has been powered-up.	a) With Rcdr #1 powered-up, the "RECORD" light(s) related to Rcdr #3 data assignment do not come ON when the crew attempts to record data assigned to Rcdr #3.	a) (1) With Rcdr #1 powered-up, data or data and voice are not received when ground dumps #3. Only the carrier wave is received from the Xmtr(s). R/T TM indicates Rcdr #3 does not have tape motion. Also, when ground attempts to record data on Rcdr #3, there is no tape motion. (2) Ground observes that Rcdr #3 power is not affected if Rcdr #1 is powered-down when Rcdr #3 is turned ON.		
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test the "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground reconfigures the Rcdrs so that Rcdr #3 is powered from Bus A or requests that the crew manually do the same.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder #2 Bus B Power Relay #1" (K3-353) (52-79703-53) (Continued)	L M S	a) (1) Pole C fails open in the latch position.	a) Rcdr #2 cannot be powered from Bus B.	a) If Rcdr #2 is configured for Bus B power, the "RECORD" light(s) related to the Rcdr's data assignment do not come ON when the crew attempts to record data assigned to the Rcdr.	a) (1) Data or data and voice are not received when the ground dumps Rcdr #2. Only the carrier wave is received from the Xmtr(s). R/T TM indicates there is no tape motion. (2) When ground attempts to record data on Rcdr #2, R/T TM indicates no tape motion.	a) N/A	--------
		b) (1) Insulating film on contacts due to contamination.	b) None. Rcdr #2 is switched to Bus A power.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch to test the "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground reconfigures the Rcdrs so that Rcdr #2 is powered from Bus A or requests that the crew manually do the same.	b) IIIb	
	L M S	a) Pole F or Pole E or Pole D fails open in the latch position or Pole C fails open in the reset position.	a) None - These poles are not functional in these positions.	a) None	a) None	a) N/A	--------
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole B fails open in the reset or latch position.	a) None - Redundancy on Pole B of Relay K3-354.	a) None	a) None	a) N/A	--------
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder #2 Bus B Power Relay #2" (K3-553) (52-79703-53) (Continued)	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	--------
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Reset coil fails open.	a) (1) Rcdr #2 will be powered-up whenever Bus B is powered-up. (2) If Rcdr 3 is configured for Bus B power and Rcdr #2 is commanded OFF Rcdr #3 cannot be powered-up. Power to Rcdr #3 is not affected if Rcdr #2 is commanded ON, i.e. with Rcdr #2 configured for Bus B power.	a) (1) When ground commands Rcdr #2 OFF, sounds emitted from the Rcdr indicate it is still running, i.e. provided its bus is still powered-up. The "RECORD" indicator light(s) related to the function which has been switched OFF extinguish as expected. (2) If end-of-tape is reached, Rcdr #2 "STOP" light (on Panel 204) comes ON. (3) If Rcdr #3 is configured for Bus B power, the "RECORD" light(s) related to the Rcdr's data assignment do not come ON when the crew attempts to record data assigned to the Rcdr unless Rcdr #2 has been commanded ON for Bus B power.	a) (1) When ground commands Rcdr #2 OFF, R/T TM indicates it still has tape motion, i.e. provided its bus is still powered-up. (2) With Rcdr #2 commanded OFF, data or data and voice are not received when ground dumps Rcdr #3. Only the carrier wave is received from the Xmtr(s). If R/T TM is ON, ground observes Rcdr #3 has no tape motion. (3) With Rcdr #2 commanded OFF, when ground attempts to record data on Rcdr #3, R/T TM indicates Rcdr #3 does not have tape motion. (4) Ground observesthat Rcdr #3 power is not affected if Rcdr #2 is commanded ON.		

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching "Recorder #2 Bus B Power Relay #1" (K3-353) (52-79703-53) (Continued)	L M S	b) Defective wire or terminal due to mechanical or thermal stress.	b) Rcdr #2 may accumulate more operating time than desired but this can be kept within an acceptable amount with proper Bus/Rcdr assignments. Rcdr #3 can be switched to Bus A power.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) (1) Ground uses the PCM Bus Select A command (S275) so that Bus B is the Exp Rcdr Bus and then switches Rcdr #2 to be the Exp 1 (or Exp 2) Rcdr or requests that the crew manually select the desired Rcdr data assignments. This reduces the time that the Rcdr will be powered-up. (2) Ground reconfigures the Rcdrs so that Rcdr #3 is powered from Bus A or requests that the crew manually do the same.	b) IIIb	
	L M S	a) Latch coil fails open.	a) If Rcdr #2 and Rcdr #3 are both configured for Bus B power, if command (manual or DCS) is given to power up Rcdr #2 and then Rcdr #3, neither Rcdr receives power. If Rcdr #3 is commanded ON before Rcdr #2 is commanded ON, only Rcdr #2 fails to receive power.	a) (1) With Rcdrs 2 and 3 powered-down, if crew commands Rcdr 2 ON and then Rcdr 3 ON, the "RECORD" lights related to these Rcdrs do not come ON. (2) With Rcdr 2 and 3 powered-down, if crew commands Rcdr 3 ON and then Rcdr 2 ON, the "RECORD" light related to Rcdr #3 comes ON while that light related to Rcdr 2 does not come ON.	a) (1) When Rcdrs 2 and 3 are powered-down, if ground commands a dump of Rcdr 2 and then Rcdr 3, data is not received from either Rcdr, only the Xmtrs' carrier waves are received. (2) When Rcdrs 2 and 3 are powered-down, if ground commands a dump of Rcdr 3 and then Rcdr 2, data is not received from Rcdr 2. The carrier wave from its Xmtr(s) is received. (3) Similarly when ground attempts to record data on Rcdrs 2 and 3, tape motion monitor channels on R/T TM show no tape motion on Rcdr #2 and no tape motion on Rcdr #3 if #3 was commanded ON after Rcdr #2 was commanded ON.		

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder #2 Bus B Power Relay #1" (K3-353) (52-79703-53) (Continued)		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. Crew or ground can perform switching to circumvent problem.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test the "RECORD" lights on Panel 204.	b) (1) Ground reconfigures the Rcdrs so that Rcdrs 2 and 3 are powered from Bus A or #3 from Bus A and #2 from Bus B. (2) Ground can direct crew to manually switch Rcdrs to desired configuration.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder #2 Bus B Power Relay #2" (K3-354) (52-79703-61) 3.9.16	M	a) Latch coil fails open.	a) If Rcdr #2 and Rcdr #3 are both configured for Bus B power, Rcdr #3 cannot be powered-up if Rcdr #2 is already powered-up. Also, when Recorder #2 is powered from Bus B, the dummy load (ARH-50, 125 ohm resistor) is not removed from +24 VDC Bus B. This results in approximately 4.8 watts additional load on the +24 volt output of the Conv. Total power requirement will not exceed the Converter's capability. If Rcdr #3 is powered-up, the dummy load is removed from Bus B.	a) (1) If Rcdr #2 is already powered-up, the "RECORD" lights related to Rcdr #3's data assignment do not come ON when the crew attempts to Rcdr data assigned to Rcdr #3. (2) If Rcdr #2 is powered-down, "RECORD" lights associated with Rcdr #3's data assignment indicate everything is normal.	a) (1) If Rcdr #2 is already powered-up, data or data and voice are not received when ground dumps Rcdr #3. Only the carrier wave is received from the Xmtr(s). R/T TM indicates there is no tape motion. (2) If Rcdr #2 is already powered-up, when ground attempts to record data on Rcdr #3, R/T TM indicates no tape motion. (3) Ground observes that operation of Rcdr #3 is not affected if Rcdr #2 is powered-down.	a) N/A	--------
		b) Defective wire or terminal due to mechanical or thermal stress.	b) Crew or ground can perform switching to circumvent problem.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) (1) Ground reconfigures the Rcdrs so that Rcdrs 2 and 3 are powered from Bus A or one from Bus A and one from Bus B. (2) Ground can direct the crew to manually switch Rcdrs to desired configuration.	b) IIIb	
	L M S	a) Pole D or Pole E or Pole F fails open in the reset or latch position.	a) None - These poles are spares.	a) None	a) None	a) N/A	--------
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder #2 Bus B Power Relay #2" (K3-354) (52-79703-61) (Continued)	L M S	a) Pole C fails open in the latch position.	a) None - Pole C is not functional in the latch position.	a) None	a) None	a) N/A	--------
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole B fails open in the reset or latch position.	a) None - Redundancy on Pole B of Relay K3-353.	a) None	a) None	a) N/A	--------
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	--------
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole C fails open in the reset position.	a) Loss of the dummy load (ARH-50, 125 ohm resistor) for the +24 VDC Bus B. This may result in a slight loss of regulation of the Bus B Converter's +5 VDC output if the +24 volt load is very small. Loss of regulation is not enough to damage any equipment.	a) None	a) R/T TM may show a slight loss of regulation of the Bus B Converter's +5 VDC output if the load on the +24 volt output is approximately 2% or less of the full load output (40 watts).	a) N/A	--------
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) Ground can switch one or both of the Transducer Groups to Bus B to increase the load on the +24 volt output of the Conv.	b) IIIb	

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COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Record #2 Bus B Power Relay #2" (K3-354) (52-79703-61) (Continued)	L M S	a) Reset coil fails open.	a) (1) Loss of dummy load (ARH-50, 125 ohm resistor) for the +24 VDC Bus B. This may result in a slight loss of regulation of the Bus B Converter's +5 VDC output if the +24 volt load is very small. Loss of regulation is not enough to damage any equipment. (2) If Rcdr #2 is powered-down, Rcdr #3 cannot be powered from Bus B. Rcdr #2 must be powered-up before Rcdr #3 can be powered-up, i.e. assuming Rcdr #2 is on Bus B.	a) If Rcdr #2 is powered-down, the "RECORD" light(s) related to Rcdr #3 data assignment do not come ON when crew attempts to record that data assigned to Rcdr #3, i.e. if Rcdr #2 is using Bus B power.	a) (1) R/T TM may show a slight loss of regulation of the Bus B Converter's +5 VDC output if the load on the +24 volt output is approximately 2% or less of the full load output (40 watts). (2) If Rcdr #2 is powered-down, ground observes through loss of data from Rcdr #3 and tape motion monitor channels on TM that there appears to have been a loss of power to Rcdr #3.	a) N/A	--------
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. Crew or ground can perform switching to circumvent the Rcdr #3 power problem.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test the "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) (1) Ground can switch one or both of the Transducer groups to Bus to increase the load on the +24 volt output of Bus B Converter. (2) Ground switches Rcdr #3 to Bus A power.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "Recorder #2 Bus B Power Relay #3" (K3-355) (52-79715-13) 3.9.17 or	L M S	a) (1) Pole A fails open when coil is energized, or (2) Coil fails open.	a) Rcdr #2 cannot be powered from Bus B.	a) If Rcdr #2 is configured for Bus B power, the "RECORD" light(s) related to the Rcdr's data assignment do not come ON when the crew attempts to record data assigned to the Rcdr.	a) (1) Data or data and voice are not received when the ground dumps Rcdr #2. Only the carrier wave is received from the Xmtr(s). R/T TM indicates there is no tape motion. (2) When ground attempts to record data on Rcdr #2, R/T TM indicates no tape motion.	a) N/A	--------
Relay, Slow Release, "Recorder #2 Bus B Power Relay #4" (K3-356) (52-79715-13) 3.9.17 (Any 1 of 2)		b) (1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) None. Rcdr #2 is switched to Bus A power.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch to test the "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground reconfigures the Rcdrs so that Rcdr #2 is powered from Bus A or requests that the crew manually do the same.	b) IIIb	
	L M S	a) Pole B of Relay K3-355 fails open when coil is energized.	a) None - Pole B of this Relay is not functional.	a) None	a) None	a) N/A	--------
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) (1) Pole B fails open when the coil is energized, or (2) Coil fails open.	a) Rcdr #2 will be powered-up whenever Bus B is powered-up.	a) (1) When crew commands Rcdr #2 OFF, sounds emitted from the Rcdr indicate it is still running, i.e. provided its bus is still powered-up. The "RECORD" indicator light(s) related to the function which has been switched OFF extinguish as expected. (2) If end-of-tape is reached, Rcdr #2 "STOP" light (on Panel 204) comes ON.	a) When ground commands Rcdr #2 OFF, R/T TM indicates it still has tape motion, i.e. provided its bus is still powered-up.	a) N/A	--------

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "Recorder #2 Bus B Power Relay #" (K3-356) (52-79715-13) (Continued)		b) (1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) Rcdr #2 may accumulate more operating time than desired but this can be kept within an acceptable amount with proper Bus/Rcdr assignments.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground uses the PCM Bus Select A command (S275) so that Bus B is the Exp Rcdr Bus and then switches Rcdr #2 to be the Exp 1 (or Exp 2) Rcdr or requests that the crew manually select the desired Rcdr data assignments. This reduces the time that the Rcdr will be powered-up.		

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Normal, "Recorder #2 Bus B Power Relay #5" (K3-357) (52-79703-1) 3.9.19	L M S	a) Pole B fails open in normally closed position.	a) Rcdr #3 cannot be powered from Bus B.	a) If Rcdr #3 is configured for Bus B power, the "RECORD" light(s) related to the Rcdr's data assignment do not come ON when the crew attempts to record data assigned to the Rcdr.	a) (1) Data or data and voice are not received when the ground dumps Rcdr #3. Only the carrier wave is received from the Xmtr(s). R/T TM indicates there is no tape motion. (2) When ground attempts to [illegible] data on Rcdr #3, [illegible]M indicates no [illegible]otion.	a) N/A	--------
		b) Insulating film on contacts due to contamination.	b) None. Rcdr #3 is switched to Bus A power.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch to test the 'RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground reconfigures the Rcdrs so that Rcdr #3 is powered from Bus A or requests that the crew manually do the same.	b) IIIb	
	L M S	a) Coil fails open.	a) Loss of time delay which prevents Rcdr 3 being turned ON a few milliseconds after Rcdr 2 has been turned ON when both Rcdrs are using Bus B power.	a) None	a) If Rcdrs 2 and 3 are turned ON at the same instant, ground may observe voltage depression on +24 VDC Bus B due to starting transient drawn when two Rcdrs are powered-up simultaneously.	a) N/A	--------
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) Ground reconfigures the Rcdrs so that Rcdrs 2 and 3 are powered from Bus A or requests that the crew manually do the same.	b) IIIb	
	L M S	a) Pole A fails open.	a) None - Pole A is a spare.	a) None	a) None	a) N/A	--------
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder #2 Bus A Power Relay #1" (K3-348) (52-79703-53) 3.9.20	M	a) Pole F fails open in the reset position.	a) If Rcdr 1 and 3 are both configured for Bus A power and Rcdr #3 is powered-up, Rcdr #1 cannot be powered-up. Power to Rcdr #1 is not affected if Rcdr #3 is powered-up after Rcdr #1 has been powered-up.	a) (1) With Rcdr #3 powered-up, the "RECORD" light(s) related to Rcdr #1 data assignment do not come ON when the crew attempts to record that data assigned to Rcdr #1. (2) "RECORD" lights function normally if Rcdr #1 is powered-up before Rcdr #3 is powered-up.	a) (1) With Rcdr #3 powered-up, data or data and voice are not received when ground dumps Rcdr #1. Only the carrier ware is received from the Xmtr(s). If R/T TM is ON, ground observes Rcdr #1 has no tape motion. (2) With Rcdr #3 powered-up, when ground attempts to record data on Rcdr #1 R/T TM indicates Rcdr #1 does not have tape motion. (3) Ground observe that Rcdr #1 power is not affected if Rcdr #3 is powered down when Rcdr #1 is turned ON.	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch to test the "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground configures the Rcdrs so that Rcdr #1 is powered from Bus B or requests that the crew manually do the same.	b) IIIb	
	L M S	a) Pole C fails open in the reset position.	a) None - not functional in this position.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole B fails open in the reset or latch position.	a) None - redundancy on Pole B of Relay K3-349.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder #2 Bus A Power Relay #1" (K3-348) (52-70703-53) (Continued)	L M S	a) Pole E fails open in the reset position.	a) Rcdr #2 cannot be powered from Bus B.	a) If Rcdr #2 is configured for Bus B power, the "RECORD" light(s) related to the Rcdr's data assignment do not come ON when the crew attempts to record data assigned to the Rcdr.	a) (1) Data or data and voice are not received when the ground dumps Rcdr #2. Only the carrier wave is received from the Xmtr(s). R/T TM indicates there is no tape motion. (2) When ground attempts to record data on Rcdr #2, R/T TM indicates no tape motion.	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None. Rcdr #2 is switched to Bus A.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch to test the "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground reconfigures the Rcdrs so that Rcdr #2 is powered from Bus A or requests that the crew manually do the same.	b) IIIb	
	L M S	a) Pole D fails open in the reset position.	a) If Rcdr 1 and 3 are both configured for Bus A power and Rcdr #1 is powered-up, Rcdr #3 cannot be powered-up. Power to Rcdr #3 is not affected if Rcdr #1 is powered-up after Rcdr #3 has been powered-up.	a) (1) With Rcdr #1 powered-up, the "RECORD" light(s) related to Rcdr #3 data assignment do not come ON when the crew attempts to record that data (2) "RECORD" lights function normally if Rcdr #3 is powered-up before Rcdr #1 is powered-up.	a) (1) With Rcdr #1 powered-up data or data and voice are not received when ground dumps Rcdr #3. Only the carrier wave is received from the Xmtr(s). If R/T TM is ON, ground observes Rcdr #3 has no tape motion. (2) With Rcdr #1 powered-up, when ground attempts to record data on Rcdr #3, T/T TM indicates Rcdr #3 does not have tape motion. (3) Ground observes that Rcdr #3 power is not affected if Rcdr #1 is powered down when Rcdr #1 is turned ON.	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch to test the "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground reconfigures the Rcdrs so that Rcdr #3 is powered from Bus A or requests that the crew manually do the same.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder #2 Bus A Power Relay #1" (K3-348) (52-79703-53) (Continued)	L M S	a) Pole D or Pole E or Pole F fails open in the latch position.	a) None - These poles are not functional in the latch position.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole C fails open in the latch position.	a) Rcdr #2 cannot be powered from Bus A.	a) If Rcdr #2 is configured for Bus A power, the "RECORD" light(s) related to the Rcdr's data assignment do not come ON when the crew attempts to record data assigned to the Rcdr.	a) (1) Data or data and voice are not received when the ground dumps Rcdr #2. Only the carrier wave is received from the Xmtr(s). R/T TM indicates there is no tape motion. (2) When ground attempts to record data on Rcdr #2, R/T TM indicates no tape motion.	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None. Rcdr #2 is switched to Bus B power.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch to test the "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground reconfigures the Rcdrs so that Rcdr #2 is powered from Bus B or requests that the crew manually do the same.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching "Recorder #2 Bus A Power Relay #1" (K3-348) (52-79703-53) (Continued)	L M S	a) Reset coil fails open.	a) (1) Rcdr #2 will be powered-up whenever Bus A is powered-up. (2) If Rcdr 3 is configured for Bus A power and Rcdr #2 is commanded OFF Rcdr #3 cannot be powered-up. Power to Rcdr #3 is not affected if Rcdr #2 is commanded ON, i.e. with Rcdr #2 configured for Bus A power.	a) (1) When crew commands Rcdr #2 OFF, sounds emitted from the Rcdr indicate it is still running, i.e. provided its bus is still powered-up. The "RECORD" indicator light(s) related to the function which has been switched OFF extinguish as expected. (2) If end-of-tape is reached, Rcdr #2 "STOP" light (on Panel 204) comes ON. (3) If Rcdr #3 is configured for Bus A power, the "RECORD" light(s) related to the Rcdr's data assignment do not come ON when the crew attempts to record data assigned to the Rcdr unless Rcdr #2 has been commanded ON for Bus A power.	a) (1) When ground commands Rcdr #2 OFF, R/T TM indicates it still has tape motion, i.e. provided its bus is still powered-up. (2) With Rcdr #2 commanded OFF data or data and voice are not received when ground dumps Rcdr #3. Only the carrier wave is received from the Xmtr(s). If R/T TM is ON, ground observes Rcdr #3 has no tape motion. (3) With Rcdr #2 commanded OFF when ground attempts to record data on Rcdr #3 R/T TM indicates Rcdr #3 does not have tape motion. (4) Ground observes that Rcdr #3 power is not affected if Rcdr #2 is commanded ON.	a) N/A	- - - - - - - - - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) Rcdr #2 may accumulate more operating time than desired but this can be kept within an acceptable amount with proper Bus/Rcdr assignments. Rcdr #3 can be switched to Bus B power.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) (1) Ground uses the PCM Bus Select B command (274) so that Bus A is the Exp Rcdr Bus and then switches Rcdr #2 to be the Exp 1 (or Exp 2) Rcdr or requests that the crew manually select the desired Rcdr data assignments. This reduces the time that the Rcdr will be powered-up. (2) Ground reconfigures the Rcdrs so that Rcdr #3 is powered from Bus B or requests that the crew manually do the same.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder #2 Bus A Power Relay #1" (K3-348) (52-79703-53) (Continued)	M	a) Latch coil fails open.	a) (1) If Rcdr #2 and Rcdr #3 are both configured for Bus A power, if command (Manual or DCS) is given to power up Rcdr #2 and then Rcdr #3, neither Rcdr receives power. (2) If Rcdr #3 is commanded ON before Rcdr #2 is commanded ON, only Rcdr #2 fails to receive power.	a) (1) With Rcdrs 2 and 3 powered-down, if crew commands Rcdr 2 ON and then Rcdr #3 ON, the "RECORD" lights related to these Rcdrs do not come ON. (2) With Rcdr 2 and 3 powered-down, if crew commands Rcdr 3 ON and then Rcdr 2 ON, the "RECORD" light related to Rcdr #3 comes ON while that light related to Rcdr #2 does not come ON.	a) (1) When Rcdrs 2 and 3 are powered-down, if ground commands a dump of Rcdr 2 and then Rcdr 3, data is not received from either Rcdr, only the Xmtrs' carrier waves are received. (2) When Rcdrs 2 and 3 are powered-down, if ground commands a dump of Rcdr 3 and then Rcdr 2, data is not received from Rcdr 2. The carrier wave from its Xmtr(s) is received. (3) Similarly when ground attempts to record data on Rcdrs 2 and 3, tape motion monitor channels on R/T TM show no tape motion on Rcdr #2 and no tape motion on Rcdr #3 if #3 was commanded ON after Rcdr #2 was commanded ON.	a) N/A	- - - - - - - - - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. Crew or ground can perform switching to circumvent problem.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test the "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) (1) Ground reconfigures the Rcdrs so that Rcdrs 2 and 3 are powered from Bus B or #3 from Bus A and #2 from Bus B. (2) Ground can direct crew to manually switch Rcdrs to desired configuration	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
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COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder #2 Bus A Power Relay #2" (K3-349) (52-79703-61) 3.9.21	M	a) Latch coil fails open.	a) If Rcdr #2 and Rcdr #3 are both configured for Bus A power, Rcdr #3 cannot be powered-up if Rcdr #2 is already powered-up. Also, when Rcdr #2 is powered from Bus A, the dummy load (ARH-50, 125 ohm resistor) is not removed from +24 VDC Bus B. This results in approximately 4.8 watts additional load on the +24 volt output of the Conv. Total power requirement will not exceed the Converter's capability. If Rcdr #3 is powered-up, the dummy load is removed from Bus A.	a) (1) If Rcdr #2 is already powered-up, the "RECORD" lights related to Rcdr #3's data assignment do not come ON when the crew attempts to record data assigned to Rcdr #3. (2) If Rcdr #2 is powered-down, "RECORD" lights associated with Rcdr #3's data assignment indicate everything is normal.	a) (1) If Rcdr #2 is already powered-up, data or data and voice are not received when ground dumps Rcdr #3. Only the carrier wave is received from the Xmtr(s). R/T TM indicates there is no tape motion. (2) If Rcdr #2 is already powered-up, when ground attempts to record data on Rcdr #3, R/T TM indicates no tape motion. (3) Ground observes that operation of Rcdr #3 is not affected if Rcdr #2 is powered-down.	a) N/A	--------
		b) Defective wire or terminal due to mechanical or thermal stress.	b) Crew or ground can perform switching to circumvent the problem.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) (1) Ground reconfigures the Rcdrs so that Rcdrs 2 and 3 are powered from Bus B or one from Bus A and one from Bus B. (2) Ground can direct the crew manually switch Rcdrs to desired configuration.	b) IIIb	
	L M S	a) Pole D or Pole E or Pole F fails open in the reset or latch position.	a) None - These poles are spares.	a) None	a) None	a) N/A	--------
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder #2 Bus A Power Relay #2" (K3-349) (52-79703-61) (Continued)	L M S	a) Pole C fails open in the latch position.	a) None - Pole C is not functional in the latch position.	a) None	a) None	a) N/A	--------
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole B fails open in the reset or latch position.	a) None - Redundancy on Pole B of Relay K3-348.	a) None	a) None	a) N/A	--------
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	--------
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole C fails open in the reset position.	a) Loss of the dummy load (ARH-50, 125 ohm resistor) for the +24 VDC Bus A. This may result in a slight loss of regulation of the Bus A Converter's +5 VDC output if the +24 volt load is very small. Loss of regulation is not enough to damage any equipment.	a) None	a) R/T TM may show a slight loss of regulation of the Bus A Converter's +5 VDC output if the load on the +24 volt output is approximately 2% or less of the full load output (40 watts).	a) N/A	--------
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) Ground can switch one or both of the Transducer Groups to Bus A to increase the load on the +24 volt output of the Conv.	b) IIIb	

DATE 31 August 1971
REVISED
REVISED

SYSTEM: Instrumentation
SUBSYSTEM: Recorder Power Control

MCDONNELL
ST. LOUIS, MISSOURI

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MODEL 1003

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Record #2 Bus A Power Relay #2" (K3-349) (52-79703-61) (Continued)	L M S	a) Reset coil fails open.	a) (1) Loss of dummy load (ARH-50, 125 ohm resistor) for the +24 VDC Bus A. This may result in a slight loss of regulation of the Bus A Converter's +5 VDC output if the +24 volt load is very small. Loss of regulation is not enough to damage any equipment. (2) If Rcdr #2 is powered-down, Rcdr #3 cannot be powered from Bus A. Rcdr #2 must be powered-up before Rcdr #3 can be powered-up, i.e. assuming Rcdr #2 is on Bus A.	a) If Rcdr #2 is powered-down, the "RECORD" light(s) related to Rcdr #3 data assignment do not come ON when crew attempts to record that data assigned to Rcdr #3, i.e. if Rcdr #2 is using Bus A power.	a) (1) R/T TM may show a slight loss of regulation of the Bus A Converter's +5 VDC output if the load on the +24 volt output is approximately 2% or less of the full load output (40 watts). (2) If Rcdr #2 is powered-down, ground observes through loss of data from Rcdr #3 and tape motion monitor channels on TM that there appears to have been a loss of power to Rcdr #3.	a) N/A	--------
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. Crew or ground can perform switching to circumvent the Rcdr #3 power problem.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test the "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) (1) Ground can switch one or both of the Transducer Groups to Bus to increase the load on the +24 volt output of Bus A Converter. (2) Ground switches Rcdr #3 to Bus B power.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "Recorder #2 Bus A Power Relay #3" (K3-350) (52-79715-13) 3.9.22 or Relay, Slow Release, "Recorder #2 Bus A Power Relay #4" (K3-351) (52-79715-13) 3.9.23 (Any 1 of 2)	L M S	a) (1) Pole A fails open when coil is energized, or (2) Coil fails open.	a) Rcdr #2 cannot be powered from Bus A.	a) If Rcdr #2 is configured for Bus A power, the "RECORD" light(s) related to the Rcdr's data assignment do not come ON when the crew attempts to record data assigned to the Rcdr.	a) (1) Data or data and voice are not received when the ground dumps Rcdr #2. Only the carrier wave is received from the Xmtr(s) R/T TM indicates there is no tape motion. (2) When ground attempts to record data on Rcdr #2, R/T TM indicates no tape motion.	a) N/A	--------
		b) (1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) None. Rcdr #2 is switched to Bus B power.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch to test the "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground reconfigures the Rcdrs so that Rcdr #2 is powered from Bus B or requests that the crew manually do the same.	b) IIIb	
	L M S	a) Pole B of Relay K3-350 fails open when coil is energized.	a) None - Pole B of this Relay is not functional.	a) None	a) None	a) N/A	--------
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) (1) Pole B fails open when the coil is energized, or (2) Coil fails open.	a) Rcdr #2 will be powered-up whenever Bus A is powered-up.	a) (1) When crew commands Rcdr #2 OFF, sounds emitted from the Rcdr indicate it is still running, i.e. provided its bus is still powered-up. The "RECORD" indicator light(s) related to the function which has been switched OFF extinguish as expected. (2) If end-of-tape is reached, Rcdr #2 "STOP" light (on Panel 204) comes ON.	a) When ground commands Rcdr #2 OFF, R/T TM indicates is still has tape motion, i.e. provided its bus is still powered-up.	a) N/A	--------

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "Recorder #2 Bus A Power Relay #4" (K3-351) (52-79715-13) (Continued)	L M S	b) (1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) Rcdr #2 may accumulate more operating time than desired but this can be kept within an acceptable amount with proper Bus/Rcdr assignments.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground uses the PCM Bus Select B command (S274) so that Bus A is the Exp Rcdr Bus and then switches Rcdr #2 to be the Exp 1 (or Exp 2) Rcdr or requests that the crew manually select the desired Rcdr data assignments. This reduces the time that the Rcdr will be powered-up.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Normal, "Recorder #2 Bus A Power Relay #5" (K3-352) (52-79703-1) 3.9.24	L M S	a) Pole B fails open in normally closed position.	a) Rcdr #3 cannot be powered from Bus A.	a) If Rcdr #3 is configured for Bus A power, the "RECORD" light(s) related to the Rcdr's data assignment do not come ON when the crew attempts to record data assigned to the Rcdr.	a) (1) Data or data and voice are not received when the ground dumps Rcdr #3. Only the carrier wave is received from the Xmtr(s) R/T TM indicates there is no tape motion. (2) When ground attempts to record data on Rcdr #3, R/T TM indicates no tape motion.	a) N/A	--------
		b) Insulating film on contacts due to contamination.	b) None. Rcdr #3 is switched to Bus B power.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch to test the "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground reconfigures the Rcdrs so that Rcdr #3 is powered from Bus B or requests that the crew manually do the same.	b) IIIb	
	L M S	a) Coil fails open.	a) Loss of time delay which prevents Rcdrs 3 being turned ON a few milliseconds after Rcdr 2 has been turned ON when both Rcdrs are using Bus A power.	a) None	a) If Rcdrs 2 and 3 are turned ON at the same instant, ground may observe voltage depression on +24 VDC Bus A due to starting transient drawn when two Rcdrs are powered-up simultaneously.	a) N/A	--------
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) Ground reconfigures the Rcdrs so that Rcdrs 2 and 3 are powered from Bus B or requests that the crew manually do the same.	b) IIIb	
	L M S	a) Pole A fails open.	a) None - Pole A is a spare.	a) None	a) None	a) N/A	--------
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder #3 Bus B Power Relay #1" (K3-361) (52-79703-53) 3.9.25	M	a) Pole F fails open in the reset position.	a) If Rcdr 1 and 2 are both configured for Bus B power and Rcdr #2 is powered-up, Rcdr #1 cannot be powered-up. Power to Rcdr #1 is not affected if Rcdr #2 is powered-up after Rcdr #1 has been powered-up.	a) (1) With Rcdr #2 powered-up, the "RECORD" light(s) related to Rcdr #1 data assignment do not come ON when the crew attempts to record that data assigned to Rcdr #1. (2) "RECORD" lights function normally if Rcdr #1 is powered-up before Rcdr #2 is powered-up.	a) (1) With Rcdr #2 powered-up, data or data and voice are not received when ground dumps Rcdr #1. Only the carrier wave is received from the Xmtr(s). If R/T TM is on, ground observes Rcdr #1 has no tape motion. (2) With Rcdr #2 powered-up, when ground attempts to record data on Rcdr #1, R/T TM indicates Rcdr #1 does not have tape motion. (3) Ground observes that Rcdr #1 power is not affected if Rcdr #2 is powered down when Rcdr #1 is turned ON.	a) N/A	--------
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch to test the "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground reconfigures the Rcdrs so that Rcdr #1 is powered from Bus B or requests that the crew manually do the same.	b) IIIb	
	L M S	a) Pole D or Pole E fails open in the latch position or Pole C fails open in the reset position.	a) None - Not functional in these positions.	a) None	a) None	a) N/A	--------
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching "Recorder #3 Bus B Power Relay #1" (K3-361) (52-79703-53) (Continued)	M	a) Pole E fails open in the reset position.	a) If Rcdr 1 and 2 are both configured for Bus B power and Rcdr #1 is powered-up, Rcdr #2 cannot be powered-up. Power to Rcdr #2 is not affected if Rcdr #1 is powered-up after Rcdr #2 has been powered-up.	a) (1) With Rcdr #1 powered-up, the "RECORD" light(s) related to Rcdr #2 data assignment do not come ON when the crew attempts to record that data assigned to Rcdr #2. (2) "RECORD" lights function normally if Rcdr #2 is powered-up before Rcdr #1 is powered-up.	a) (1) With Rcdr #1 powered-up, data or data and voice are not received when ground dumps Rcdr #2. Only the carrier wave is received from the Xmtr(s). If R/T TM is ON, ground observes Rcdr #2 has no tape motion. (2) With Rcdr #1 powered-up, when ground attempts to record data on Rcdr #2, R/T TM indicates Rcdr #2 does not have tape motion. (3) Ground observes that Rcdr #2 power is not affected if Rcdr #1 is powered down when Rcdr #2 is turned ON.	a) N/A	--------
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch to test the "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground reconfigures the Rcdrs so that Rcdr #2 is powered from Bus A or requests that the crew manually do the same.	b) IIIb	
	L M S	a) Pole B fails open in the reset or latch position.	a) None - Redundancy on Pole B of Relay K3-362.	a) None	a) None	a) N/A	--------
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder #3 Bus B Power Relay #1" (K3-361) (52-79703-53) (Continued)	L M S	a) (1) Pole C fails open in the latch position, or (2) Latch coil fails open.	a) Rcdr #3 cannot be powered from Bus B.	a) If Rcdr #3 is configured for Bus B power, the "RECORD" light(s) related to the Rcdr's data assignment do not come ON when the crew attempts to record data assigned to the Rcdr.	a) (1) Data or data and voice are not received when the ground dumps Rcdr #3. Only the carrier wave is received from the Xmtr(s). R/T TM indicates there is no tape motion. (2) When ground attempts to record data on Rcdr #3, R/T TM indicates no tape motion.	a) N/A	--------
		b) (1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) None. Rcdr #3 is switched to Bus A power.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch to test the "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground reconfigures the Rcdrs so that Rcdr #3 is powered from Bus A or requests that the crew manually do the same.	b) IIIb	
	L M S	a) Latch coil fails open.	a) Rcdr #3 will be powered-up whenever Bus B is powered-up.	a) (1) When crew commands Rcdr #3 OFF, sounds emitted from the Rcdr indicate it is still running, i.e. provided its bus is still powered-up. The "RECORD" indicator light(s) related to the function which has been switched OFF extinguish as expected. (2) If end-of-tape is reached, Rcdr #3 "STOP" light (on Panel 204) comes ON.	a) When ground commands Rcdr #3 OFF, R/T TM indicates it still has tape motion, i.e. provided its bus is still powered-up.	a) N/A	--------

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder #3 Bus B Power Relay #1" (K3-3C1) (52079703-53) (Continued)	L M S	b) Defective wire or terminal due to mechanical or thermal stress.	b) Rcdr #3 may accumulate more operating time than desired but this can be kept within an acceptable amount with proper Bus/Rcdr assignments.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground uses the PCM Bus Select A command (S275) so that Bus B is the Exp Rcdr Bus and then switches Rcdr #3 to be the Exp 1 (or Exp 2) Rcdr or requests that the crew manually select the desired Rcdr data assignments. This reduces the time that the Rcdr will be powered-up.	b) IIIb	
	L M S	a) Pole D fails open in the reset position.	a) Rcdr #3 cannot be powered from Bus A.	a) If Rcdr #3 is configured for Bus A power, the "RECORD" light(s) related to the Rcdr's data assignment do not come ON when the crew attempts to record data assigned to the Rcdr.	a) (1) Data or data and voice are not received when the ground dumps Rcdr #3. Only the carrier wave is received from the Xmtr(s). R/T TM indicates there is no tape motion. (2) When ground attempts to record data on Rcdr #3, R/T TM indicates no tape motion.	a) N/A	--------
		b) Insulating film on contacts due to contamination.	b) None. Rcdr #3 is switched to Bus B power.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch to test the "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground reconfigures the Rcdrs so that Rcdr #3 is powered from Bus B or requests that the crew manually do the same.	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	--------
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder #3 Bus B Power Relay #2" (K3-362) (52-79703-61) 3.9.26	L M S	a) (1) Pole C fails open in the reset position, or (2) Reset coil fails open.	a) (1) Loss of dummy load (ARH-50, 125 ohm resistor) for the +24 VDC Bus B. This may result in a slight loss of regulation of the Bus B Converter's +5 VDC output if the +24 volt load is very small. Loss of regulation is not enough to damage any equipment.	a) None	a) (1) R/T TM may show a slight loss of regulation of the Bus B Converter's +5 VDC output if the load on the +24 volt output is approximately 2% or less of the full load output (40 watts).	a) N/A	--------
		b) (1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) None	b) None	b) (1) Ground can switch one or both of the Transducer groups to Bus to increase the load on the +24 volt output of Bus B Converter.	b) IIIb	
	L M S	a) Latch coil fails open.	a) When Recorder #3 is powered from Bus B, the dummy load (ARH-50, 125 ohm resistor) is not removed from Bus B. This results in approximately 4.8 watts additional load on the +24 volt output of the Conv. Total power requirement will not exceed the Converter's capability. If another Conv. is also powered from Bus B, power is removed from the dummy load.	a) None	a) None	a) N/A	--------
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "Recorder #3 Bus B Power Relay #3" (K3-363) (52-79715-13) 3.9.27	L M S	a) (1) Pole A fails open when the coil is energized, or (2) Coil fails open.	a) Rcdr #3 cannot be powered from Bus B.	a) If Rcdr #3 is configured for Bus B power, the "RECORD" light(s) related to the Rcdr's data assignment do not come ON when the crew attempts to record data assigned to the Rcdr.	a) (1) Data or data and voice are not received when the ground dumps Rcdr #3. Only the carrier wave is received from the Xmtr(s). R/T TM indicates there is no tape motion. (2) When ground attempts to record data on Rcdr #3, R/T TM indicates no tape motion.	a) N/A	--------
		b) (1) Insulating film on contacts due to contamination, or (2) Defective wire or terminal due to mechanical or thermal stress.	b) None. Rcdr #3 is switched to Bus A power.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch to test the "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground reconfigures the Rcdrs so that Rcdr #3 is powered from Bus A or requests that the crew manually do the same.	b) IIIb	
	L M S	a) (1) Pole B fails open when the coil is energized, or (2) Coil fails open.	a) Rcdr #3 will be powered-up whenever Bus B is powered-up.	a) (1) When crew commands Rcdr #3 OFF, sounds emitted from the Rcdr indicate it is still running, i.e. provided its bus is still powered-up. The "RECORD" indicator light(s) related to the function which has been switched OFF extinguish as expected. (2) If end-of-tape is reached, Rcdr #3 "STOP" light (on Panel 204) comes ON.	a) When ground commands Rcdr #3 OFF, R/T TM indicates it still has tape motion, i.e. provided its bus is still powered-up.	a) N/A	--------

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "Recorder #3 Bus B Power Relay #3" (K3-363) (52-79715-13) 3.9.27		b) (1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) Rcdr #3 may accumulate more operating time than desired but this can be kept within an acceptable amount with proper Bus/Rcdr assignments.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground uses the PCM Bus Select A command (S275) so that Bus B is the Exp Rcdr Bus and then switches Rcdr #3 to be the Exp 1 (or Exp 2) Rcdr or requests that the crew manually select the desired Rcdr data source. This reduces the time that the Rcdr will be powered-up.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder #3 Bus A Power Relay #1" (K3-358) (52-79703-53) 3.9.28	M	a) Pole F fails open in the reset position.	a) If Rcdrs 1 and 2 are both configured for Bus A power and Rcdr #2 is powered-up, Rcdr #1 cannot be turned ON. Power to Rcdr #1 is not affected if Rcdr #2 is powered-up after Rcdr #1 has been powered-up.	a) (1) With Rcdr #2 powered-up, the "RECORD" light(s) related to Rcdr #1 data assignment do not come ON when the crew attempts to record data assigned to Rcdr #1. (2) "RECORD" lights function normally if Rcdr #1 is powered-up before Rcdr #2 is powered-up.	a)(1) With Rcdr #2 powered-up, data or data and voice are not received when ground dumps Rcdr #1. Only the carrier wave is received from the Xmtr(s). (2) With Rcdr #2 powered-up, when ground attempts to record data on Rcdr #1, R/T TM indicates Rcdr #1 does not have tape motion. (3) Ground observes that Rcdr #1 power is not affected if Rcdr #2 is powered-down when Rcdr #1 is turned ON.	a) N/A	—
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b)(1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground reconfigures the Rcdrs so that Rcdr #1 is powered from Bus A or requests that the crew manually do the same.	b) [illegible]	
	L M S	a) Pole D or Pole E or Pole F fails open in the latch position.	a) None - These poles are not functional in the latch position.	a) None	a) None	a) N/A	—
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) [illegible]	
	L M S	a) Pole B fails open in the reset or latch position.	a) None - Redundancy on Pole B of Relay K3-359.	a) None	a) None	a) N/A	—
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) [illegible]	
	L M S	a)(1) Pole C fails open in the latch position, or(2) Latch coil fails open.	a) Rcdr #3 cannot be powered from Bus A.	a) If Rcdr #3 is configured for Bus A power, the "RECORD" light(s) related to the Rcdr's data assignment do not come ON when the crew attempts to record data assigned to the Rcdr.	a)(1) Data or data and voice are not received when the ground dumps Rcdr #3. Only the carrier wave is received from the Xmtr(s). R/T TM indicates there is no tape motion.	a) N/A	—

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder #3 Bus A Power Relay #1" (K3-358) (52-79703-53) (Continued)	L M S				a)(2) When ground attempts to record data on Rcdr #3, R/T TM indicates no tape motion.	a) N/A	—
		b) (1) Insulating film on contacts due to contamination	b) None. Rcdr #3 is switched to Bus B power.	b)(1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch to test the "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground reconfigures the Rcdrs so that Rcdr #3 is powered from Bus B or requests that the crew manually do the same.	b) IIIb	
	L M S	a) Reset coil fails open.	a) Rcdr #3 will be powered-up whenever Bus A is powered-up.	a)(1) When crew commands Rcdr #3 OFF, sounds emitted from the Rcdr indicate it is still running, i.e., provided its bus is still powered-up. The "RECORD" indicator light(s) related to the function which has been switched OFF extinguish as expected. (2) If end-of-tape is reached, Rcdr #3 "STOP" light (on Panel 204) comes ON.	a) When ground commands Rcdr #3 OFF, R/T TM indicates it still has tape motion, i.e., provided its bus is still powered-up.	a) N/A	—
		b) Defective wire or terminal due to mechanical or thermal stress.	b) Rcdr #3 may accumulate more operating time than desired, but this can be kept within an acceptable amount with proper Bus/Rcdr assignments.	b)(1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground uses the PCM Bus Select B command (S274) so that Bus A is the Exp Rcdr Bus and then switches Rcdr #3 to be the Exp 1 (or Exp 2) Rcdr or requests that the crew manually select the desired Rcdr data assignments. This reduces the time that the Rcdr will be powered-up.	b) IIIb	
	M	a) Pole E fails open in the reset position.	a) If Rcdrs 1 and 2 are both configures for Bus A power and Rcdr #1 is powered-up, Rcdr #2 cannot be powered-up. Power to Rcdr #2 is not affected if Rcdr #1 is powered-up after Rcdr #2 has been powered-up.	a)(1) With Rcdr #1 powered-up, the "RECORD" light(s) related to Rcdr #2 data assignment do not come ON when the crew attempts to record data assigned to Rcdr #2.	a)(1) With Rcdr #1 powered-up, data or data and voice are not received from Rcdr #2 when the ground dumps Rcdr #2. Only the carrier wave is received from the Xmtr(s). If R/T TM is ON, ground observes that Rcdr #2 does not have tape motion.	a) N/A	—

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder #3 Bus A Power Relay #1" (K3-358) (52-79703-53) (Continued)	M			a)(2) If Rcdr #1 is not powered-up, the "RECORD" lights associated with Rcdr #2's data assignment indicate everything is normal.	a)(2) Similarly, if Rcdr #1 is powered-up, R/T TM indicates no tape motion when ground attempts to record data on Rcdr #2. (3) Ground observes that power to Rcdr #2 is not affected if Rcdr #1 is powered-down when Rcdr #2 is turned ON.	a) N/A	—
		b) Insulating film on contacts due to contamination.	b) None. Crew or crew can perform switching to circumvent the problem.	b)(1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch to test "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground reconfigures the Rcdrs so that Rcdr #2 is powered from Bus B or requests that the crew manually do the same.	b) [redacted]	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	—
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) [redacted]	
	L M S	a) Pole D fails open in the reset position.	a) Rcdr #3 cannot be powered from Bus B.	a) If Rcdr #3 is configured for Bus B power, the "RECORD" light(s) related to the Rcdr's data assignment do not come ON when the crew attempts to record data assigned to the Rcdr.	a)(1) Data or data and voice are not received when the ground dumps Rcdr #3. Only the carrier wave is received from the Xmtr(s). R/T TM indicates there is no tape motion. (2) When ground attempts to record data on Rcdr #3, R/T TM indicates no tape motion.	a) N/A	—
		b) Insulating film on contacts due to contamination.	b) None. Rcdr #3 is switched to Bus A power.	b)(1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch to test the "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground reconfigures the Rcdrs so that Rcdr #3 is powered from Bus A or requests that the crew manually do the same.	b) [redacted]	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder #3 Bus A Power Relay #1 (K3-358) (52-79703-53) 3.9.28	L M S	a) Pole C fails open in the reset position. b) Insulating film on contacts due to contamination.	a) None - Pole C is not functional in the reset position. b) None	a) None b) None	a) None b) None	a) N/A b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder #3 Bus A Power Relay #2" (K3-359) (52-79703-61) 3.9.29	L M S	a) (1) Pole C fails open in the reset position, or (2) Reset coil fails open.	a) Loss of the dummy load (ARH-50, 125 ohm resistor) for the +24 VDC Bus A. This may result in a slight loss of regulation of the Bus A Converter's +5 VDC output if the +24 volt load is very small. Loss of regulation is not enough to damage any equipment.	a) None	a) TM may show a slight loss of regulation of Bus A converter's #5 VDC output if the load on the +24 volt output is approximately 2% or less of the full load output (40 watts).	a) N/A	--
		b) (1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) None	b) None	b) Ground can switch one or both of the Transducer Groups to Bus A to increase the load on the +24 volt output of the Conv. Note - The Tranducer groups are normally powered from the PCM Bus.	b) IIIB	
	L M S	a) Pole D or Pole E or Pole F fails open in the reset or latch position.	a) None - These poles are spares.	a) None	a) None	a) N/A	--
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole C fails open in the latch position.	a) None - Not functional in latch position.	a) None	a) None	a) N/A	--
		b) Insulating film on contacts due to contamination	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder #3 Bus A Power Relay #2" (K3-359) (52-79703-61) (Continued)	L M S	a) Pole B fails open in the reset or latch position.	a) None - GSE use only	a) None	a) None	a) N/A	--
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Latch coil fails open.	a) When Recorder #3 is powered from Bus A, the dummy load (ARH-50, 125 ohm resistor) is not removed from Bus A. This results in approximately 4.8 watts additional load on the +24 volt output of the Conv. Total power requirement will not exceed the Converter's capability.	a) None	a) None	a) N/A	--
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None	b) None	b) None	b) III	
	L M S	a) Pole A fails open in the reset of latch position.	a) None - GSE use only	a) None	a) None	a) N/A	--
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "Recorder #3 Bus A Power Relay #3 (K3-360) (52-79715-13) 3.9.30	L M S	a) (1) Coil fails open, or (2) Pole A fails open when coil is energized.	a) Rcdr #3 cannot be powered from Bus A.	a) If Rcdr #3 is configured for Bus A power, the "RECORD" light (s) related to the Rcdr's data assignment do not come ON when the crew attempts to record data assigned to the Rcdr.	a) (1) Data or data and voice are not received when the ground dumps Rcdr #3. Only the carrier wave is received from the Xmtr(s). R/T TM indicates there is no tape motion. (2) When ground attempts to record data on Rcdr #3, R/T TM indicates no tape motion.	a) N/A	--
		b) (1) Defective wire or terminal due to mechanical stress. (2) Insulating film on contacts due to contamination	b) None. Rcdr #3 is switched to Bus B power.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch to test the "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground reconfigures the Rcdrs so that Rcdr #3 is powered from Bus B or requests that the crew manually do the same	b) IIIb	
	L M S	a) (1) Coil fails open, or (2) Pole B fails open when coil is energized	a) Rcdr #3 will be powered-up whenever Bus A is powered-up.	a) (1) When crew commands Rcdr #3 OFF, sounds emitted from the Rcdr indicate it is still running, i.e. provided its bus is still powered-up. The "RECORD" indicator light related to the function which has been switched off extinguish as expected. (2) If end-of-tape is reached, Rcdr #3 "STOP" light (on Panel 204) comes ON.	a) When ground commands Rcdr #3 OFF, R/T TM indicates it still has tape motion, i.e. provided its bus is still powered-up.	a) N/A	--

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release; "Recorder #3 Bus A Power Relay #3 (K3-360) (52-79715-13) 3.9.30 (Continued)		b) (1) Defective wire or terminal due to mechanical or thermal stress. (2) Insulating film on contacts due to contamination	b) Rcdr #3 may accumulate more operating time than desired but this can be kept within an acceptable amount with proper Bus/Rcdr assignments.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground uses the PCM Bus Select B command (3274) so that Bus A is the Exp Rcdr Bus and then switches Rcdr #3 to be the Exp 1 (or Exp 2) Rcdr or requests that the crew manually select the desired Rcdr data assignments. This reduces the time that the Rcdr will be powered-up.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Fuse, 3.6 amps, "Tape Recorder" (3-122) (3-123) (3-124) 3.9.31 3.9.32 3.9.33	L M S	a) Fails open before normal rated current is exceeded.	a) Loss of power to that Tape Recorder which receives power through the failed fuse.	a) (1) When crew attempts to use the affected Rcdr for recording data, the "RECORD" indicator lights associated with the failed Rcdr does not come ON. (2) The "STOP" light (on Panel 204) for the affected Rcdr will come ON when the crew or the ground attempts to use the Rcdr.	a) (1) Ground does not receive data from the failed Rcdr. R/T TM indicates there is not tape motion.	a) N/A	---
(Any one of three)		b) Mechanical or thermal stress.	b) There is a loss of one tape Rcdr. Only two Rcdr slots will be available for the remainder of the mission.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly.	b) Ground revises data recording schedule to allow for the loss of one Tape Rcdr slot.	b) IIIb	
Resistor, Wire wound, RWR84S1910FR-AM (191 ohms) 3.9.34 3.9.35 3.9.36 (Any one of Three)	M	a) Resistor fails open.	a) When the associated Rcdr is operating, there is false indication of no tape motion on the Rcdr's "STOP" light (on Panel 204).	a) (1) When the crew or ground uses the affected Rcdr, the Rcdr's "STOP" LIGHT comes ON. (2) When the crew attempts to use the affected Rcdr for recording data, the "RECORD" indicator lights associated with the Rcdr come ON as expected.	a) None	a) N/A	---
		b) Mechanical or thermal stress.	b) Loss of indication to the crew if end-of-tape is reached or a tape stoppage occurs except via the "RECORD" indicator lights.	b) Crew informs the ground of the anomaly.	b) Ground verifies that TM indicates the Rcdr has tape motion and that data is received when the Rcdr is dumped.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Portable Timer, 61B880051 3.10.01 3.10.02 (Any 1 of 2) The Portable Timer is used to time events.	M	a) Timer ceases to operate. b) Component failure due to mechanical or thermal stress.	a) No effect on the other systems. b) (1) None, due to redundancy provided by the Digital Clock and ground communications. (2) There may be some inconvenience because of the lack of an audible signal at the end of the set time interval on the Digital Clock.	a) Crew notes that the hands on the dial of the Timer do not change position. b) (1) Crew replaces Portable Timer Battery. (2) Crew uses the onboard spare Portable Timer. (3) Crew informs ground of the anomaly. (4) If necessary, crew uses the Digital Clock for timing events.	a) None b) None	a) N/A b) IIIb	- - - - - - - - - -

DATE 31 August 1971
REVISED
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SYSTEM: INSTRUMENTATION
SUBSYSTEM: AM PROGRAMMERS

MCDONNELL
ST. LOUIS, MISSOURI

REPORT F673, Vol. II
MODEL 1003

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
				SEE PAGE 3.6.1			

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
PCM Low-Level Multiplexer (52-85713-895) (Any 1 of 14) 3.12.01 thru 3.12.05, 3.14.01, 3.14.02 and 3.15.01 thru 3.15.07 Low Level Multiplexer Distribution is 7 in the AM and 7 in the OWS.	L M S	a) Loss of thirty two of thirty two analog channels	a) Loss of those telemetered parameters which are dependent upon the failed low level multiplexer.	a) None	a) Loss of all data from the failed Low Level Multiplexer.	a) N/A	- - - - - - - - - -
		b) Defective component due to mechanical or thermal stress.	b) None, other than a loss of data from the failed multiplexer. Loss of one Low Level Multiplexer does not prevent continuation of the mission.	b) None	b) Some of the lost TM parameters may be available on Panel Indicators. Ground requests that the crew relay these displayed parameters via voice as needed.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
PCM High Level Multiplexer (52-85713-897) (Any 1 of 11) 3.13.01 thru 3.13.05, 3.14.03, and 3.15.08 thru 3.15.12 High Level Multiplexer Distribution is 6 in the AM and 5 in the CWS.	L M S	a) Loss of thirty two of thirty two analog channels.	a) Loss of all analog data from the failed multiplexer.	a) None	a) Ground observes a loss of analog data from the failed multiplexer.	a) N/A	- - - - - - - - - -
		b) Defective component due to mechanical or thermal stress.	b) None, other than a loss of analog data from the failed multiplexer. Loss of one High Level Multiplexer does not prevent continuation of the mission.	b) None	b) Some of the lost TM parameters may be available on Panel Indicators. Ground requests the crew relay these displayed parameters via voice as needed.	b) IIIb	
	L M S	a) Loss of twenty four of twenty four bi-level signal channels.	a) Loss of all bi-level signals from the failed multiplexer. NOTE - The PCM System is configured to used the bi-level channels only from the following High Level Multiplexers: CWS- J, K and T. AM - R, F, S, B and U.	a) None	a) Ground observes a loss of bi-level data from the failed multiplexer.	a) N/A	- - - - - - - - - -
		b) Defective component due to mechanical or thermal stress.	b) None, other than a loss of bi-level data from the failed multiplexer. Loss of this data from one multiplexer does not prevent continuation of the mission.	b) None	b) Some of the lost TM parameters may be available on Panel Lights/Switches. Ground requests that the crew relay these displayed parameters via voice as needed.	b) IIIb	
	L M S	a) Loss of sixteen of sixteen bi-level pulsed channels.	a) Loss of all bi-level pulsed channels from the failed multiplexer. NOTE - The PCM System is configured to use the bi-level pulsed channels only from the following High Level Multiplexers: CWS- J, K and T. AM - R, F, S, B and U.	a) None	a) Ground observes a loss of bi-level pulsed data from the failed multiplexer.	a) N/A	- - - - - - - - - -
		b) Defective component due to mechanical or thermal stress.	b) None, other than a loss of bi-level pulsed data from the failed multiplexer. Loss of this data does not prevent continuation of the mission.	b) None	b) Some of the lost parameters may be available on Panel Lights/Switches. Ground requests that the crew relay the desired information as needed.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
				SEE PAGES 3.12.1 AND 3.13.1			

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
				SEE PAGES 3.12.1 AND 3.13.1			

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Fusitor, TM Voltage Monitor (3-23 thru 3-26) (52-79720-31) (Any 1 of 4) 3.16.01 thru 3.16.04	L M S	a) Opens before rated current is exceeded.	a) Loss of TM readout of SAS Array Group Voltage from one of the Solar Arrays, Group 1, 2, 3 or 4.	a) None	a) Ground receives zero voltage reading for the affected Solar Array.	a) N/A	- - - - - - - - - -
		b) Mechanical or thermal stress.	b) None	b) None	b) Evaluate system performance via remaining system parameters such as SAS Array Group Current for the affected Array, Battery State of Charge and Battery Voltage for the PCG associated with the affected Array.		
Fusitor, TM Voltage Monitor (3-31 thru 3-34) (52-79720-31) (Any 1 of 4) 3.16.05 thru 3.16.08	L M S	a) Opens before rated current is exceeded.	a) Loss of TM readout of the voltage of Battery 1, 2, 3, or 4.	a) None	a) Ground receives zero voltage reading for the affected Battery.	a) N/A	- - - - - - - - - -
		b) Mechanical or thermal stress.	b) None	b) None	b) (1) Evaluate system performance via remaining parameters. (2) Request that the crew read the battery voltage as displayed on Panel 204.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Circuit Breaker, Magnetic, "TRANSDUCER GROUP 2, +24 V" (3-81) (52-79721-322) (3.9 amps) (on Panel 200) 3.16.09	L M S	a) Opens before normal break current is exceeded.	a) There is a loss of +24 VDC power for the following equipment or functions: o Instrumentation Package 2B. o Those bi-level discretes which use +24V Group 2 power.	a) None	a) (1) Questionable data from those Instrumentation Package 2B Signal Conditioners which use +24 VDC power. (2) No power indication for those bi-level discretes using +24V Group 2 power.	a) N/A	- - - - - - - - - -
		b) Internal defect, coil short to ground.	b) (1) Loss of TM data for those parameters requiring +24 V Group 2 power. (2) Mission need not be shortened. Sufficient data is available with just Group 1 +24V power.	b) None	b) (1) Ground requests that the crew check the Group 2 +24V circuit breaker. (2) Ground instructs crew in procedures/switching necessary to utilize the Group 1 Transducers as much as possible.	b) IIIb	
Circuit Breaker, Magnetic, "TRANSDUCER GROUP1, +24V" (3-12) (52-79721-322) (3.9 amps) (on Panel 200) 3.16.10	L M N	a) Opens before normal break current is exceeded.	a) There is a loss of +24VDC power for the following equipment or functions: o Instrumentation Package 2A. o Those bi-level discretes which use +24V Group 1 power.	a) None	a) (1) Questionable data from those Instrumentation Package 2A Signal Conditioners which use +24 VDC power. (2) No power indication for those bi-level discretes using +24V Group 1 power.	a) N/A	- - - - - - - - - -
		b) Internal defect, coil short to ground.	b) (1) Loss of TM data for those parameters requiring +24V Group 1 power. (2) Mission need not be shortened. Sufficient data is available with just Group 2 +24V power.	b) None	b) (1) Ground requests that the crew check the Group 1 +24V circuit breaker. (2) Ground instructs crew in procedures/switching necessary to utilize the Group 2 Transducers as much as possible.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Fusitor, TM Voltage Monitor (3-27 thru 3-30) (52-79720-31) (Any 1 of 4) 3.17.01 thru 3.17.04	L M S	a) Opens before rated current is exceeded.	a) Loss of TM readout of SAS Array Group Voltage from one of the Solar Arrays, Group 5, 6, 7 or 8.	a) None	a) Ground receives zero voltage reading for the affected Solar Array.	a) N/A	- - - - - - - - - -
		b) Mechanical or thermal stress.	b) None	b) None	b) Evaluate system performance via remaining system parameters such as SAS Array Group Current for the affected Array, Battery State of Charge and Battery Voltage for the PCG associated with the affected Array.	b) IIIb	
Fusitor, TM Voltage Monitor (3-35 thru 3-38) (52-79720-31) (Any 1 of 4) 3.17.05 thru 3.17.08	L M S	a) Opens before rated current is exceeded.	a) Loss of TM readout of the voltage of Battery 5, 6, 7 or 8.	a) None	a) Ground receives zero voltage reading for the affected Battery.	a) N/A	- - - - - - - - - -
		b) Mechanical or thermal stress.	b) None	b) None	b) (1) Evaluate system performance via remaining system parameters. (2) Request that the crew read the battery voltage as displayed on Panel 204.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Fusitor, TM Voltage Monitor (3-40 thru 3-45, 3-48, 3-49, 3-101, 3-102, 3-108, 3-109, 3-114, 3-115) (52-79720-31) (Any one of fourteen) 3.18.01 thru 3.18.14	L M S	a) Opens before rated current is ecceeded.	a) Loss of TM readout of voltage of one of the AM Buses, or Reg. Buses, or EPS Buses, or Deploy Buses, or Transfer Buses, or Sequential Buses, or EREP Buses.	a) None	a) Ground receives zero voltage reading for the affected bus.	a) N/A	- - - - - - - - - -
		b) Mechanical or thermal stress.	b) None	b) None	b) (1) Evaluate system performance via remaining system parameters. (2) If zero reading is for a Reg or Transfer Bus, ground requests that the crew read the bus voltage as displayed on Panel 206.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Circuit Breaker, Magnetic, Transducer Group 1 -24V" (3-70) Panel 200) (52-79721-322) (3.9 amps) 3.18.15	L M S	a) Opens before normal break current is exceeded.	a) There is a loss of -24 VDC power to Instrumentation Package 2A. This results in erroneous data from those Instrumentation Package 2A Signal Conditioners which require -24 VDC power.	a) None	a) Ground observes questionable data from those Instrumentation Package 2A parameters which require -24 VDC power for signal conditioning.	a) N/A	- - -
		b) Internal defect, coil short to ground	b) (1) Loss of TM data for those parameters requiring Group 1 -24 VDC power. (2) Mission can be continued without these parameters.	b) None	b) (1) Ground requests that the crew check the readings for those questionable parameters which are displayed on panel meters. (2) Ground requests that the crew check the "Group 1 -24 VDC" circuit breaker.	b) IIIb	
Circuit Breaker, Magnetic, Transducer Group 2 -24V" (3-82) Panel 200) (52-79721-322) (3.9 amps) 3.18.16	L M S	a) Opens before normal break current is exceeded.	a) There is a loss of -24 VDC power to Instrumentation Package 2B. This results in erroneous data from those Instrumentation Package 2B Signal Conditioners which require -24 VDC power.	a) None	a) Ground observes questionable data from those Instrumentation Package 2B parameters which require -24 VDC power for signal conditioning.	a) N/A	- - -
		b) Internal defect, coil short to ground.	b) (1) Loss of TM data for those parameters requiring Group 2 -24 VDC power. (2) Mission can be continued without these parameters.	b) None	b) (1) Ground requests that the crew check the readings for those questionable parameters which are displayed on panel meters. (2) Ground requests that the crew check the "Group 2 -24V" circuit breaker.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Switch, Rotary, "BAT CHARGE (%)" (52-79705-65) (on Panel 206) 3.18.17	M	a) Contact set (10, 11 or 10, 12 or 10, 13 or 10, 14 or 10, 15 or 10, 16 or 10, 17 or 10, 18) fails open.	a) Loss of power from the primary amp-hour meter of the respective Battery Charger to the Battery State of Charge indicator on Panel 206. Readout of the secondary amp-hour meter is not affected.	a) When the switch is in the position where the failed contacts are used, the "PRI BAT CHARGE (%)" indicator reads zero. The "SEC BAT CHARGE (%)" indicator does not read zero.	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) (1) Crew informs ground of the anomaly and requests that the ground give the TM readout of the primary and secondary amp-hour meter of the affected Battery Charger.	b) None	b) IIIb	
	M	a) Contact set (30, 31 or 30,32 or 30,33 or 30,34 or 30,35 or 30, 36 or 30,37 or 30,38) fails open.	a) Loss of power from the secondary amp-hour meter of the respective Battery Charger to the Battery State of Charge indicator on Panel 206. Readout of the primary amp-hour meter is not affected.	a) When the switch is in the position where the failed contacts are used, the "SEC BAT CHARGE (%)" indicator reads zero. The "PRI BAT CHARGE (%)" indicator does not read zero.	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) (1) Crew informs ground of the anomaly and requests that the ground give the TM readout of the primary and secondary amp-hour meter of the affected Battery Charger.	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Circuit Breaker, Magnetic, "DISPLAY CONVERTERS OUTPUT +24V" (3-78) (52-79721-322) (3.9 amps) 3.19.01	M	a) Opens before normal break current is exceeded.	a) Loss of +24 VDC power to the following sensors: ° Condensate Dump Temp. ° Fwd. Compt. Condensate Tank Diff. Pressure ° Mole Sieve A/B Compressor Inlet Temp. ° Mole Sieve A/B Cond. Heat Exchange Air Outlet Temp. ° Mole Sieve A/B Inlet $PPCO_2$. o O_2/N_2 Bottle Temp. Sensors	a) (1) The following panel indicators assume the no power (rest) position: ° The "TANK ΔP" and "VENT TEMP" indicators (located on the Condensate Control Panel). ° The "HT EXCH" and "$PPCO_2$ indicators (located on the Molecular Sieve Panel). ° The O_2/N_2 bottle temperature indicators on Panel 225.	a) (1) Ground observes no power readings for the following TM parameters: • H_2O Condensate Tank - Diff. (D208). • Mole Sieve A/B - PCO_2 Inlet (D209/D213).	a) N/A	
		b) Internal defect, coil short to ground.	b) None	b) (1) Crew attempts to reset the "Display +24V" circuit breaker (located on the left hand C/B Panel). (2) Crew must adjust the Condensate Tank dump procedure to allow for loss of "TANK ΔP" and "VENT TEMP" parameters. (3) Crew informs the ground of the aromaly.	b) (1) Ground informs crew of revised procedure for dumping the Condensate Tank. (2) Ground requests that the crew check the circuit breaker. (3) Ground monitors O_2 and N_2 Bottle temperature.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Circuit Breaker, Magnetic, "DISPLAY CONVERTERS OUTPUT, +5V" (3-80) (52-79721-322) (on Panel 200) 3.19.02	M	a) Opens before normal break current is exceeded.	a) (1) Loss of +5VDC display power to the following differential pressure sensors: o Aft Compt. o Fwd Compt. o Lock Compt. (2) Loss of +5VDC display power to the following pressure transducers: o 120 PSI O_2 Regulator Output o 150 PSI N_2 Regulator Output o N_2 Bottles o O_2 Bottles (3) The +5VDC power for the TM output of these sensors is not affected.	a) The following panel indicators assume the no power (rest) position: o The O /N bottle pressure (200/225 PSI) and the "FWD", "LOCK" and "AFT" indicators (located on Panel 225). o The "LOCK", "AFT" and "O_2" pressure indicators (located on Panel 316).	a) None	a) N/A	---
Functional Description: This C/B provides circuit protection for those sensors requiring +5 volt display power.		b) Internal defect, coil short to ground.	b) (1) No effect on the mission. Cabin pressure can be monitored on TM or via the CWS pressure indicators located on Panel 205 and Panel 316. Crew can also verify pressure integrity via the "PPO_2" indicators located on the O_2/N_2 Control Panel. (2) Rapid Δ Pressure loss Emergency signal not affected by power loss.	b) (1) Crew notifies ground of the anomalies. (2) Crew attempts to reset the circuit breaker. (3) When repressurizing the Clustor, crew verifies pressure readings by voice communications with the ground.	b) None	b) IIIb	
Circuit Breaker, Magnetic, "DISPLAY CONVERTERS OUTPUT, -24" (3-79) (52-79721-322) (on Panel 200) 3.19.03	M	a) Opens before normal break current is exceeded.	a) Loss of -24 VDC power to the $PPCO_2$ Inlet sensors.	a) Questionable readings on the "$PPCO_2$ IN" indicators. (located on Panel 203).	a) Ground observes questionable $PPCO_2$ Inlet levels on TM.	a) N/A	
		b) Internal defect, coil short to ground.	b) None. Power to $PPCO_2$ Outlet Sensors is not affected.	b) (1) Crew attempts to reset the circuit breaker.	b) (1) Ground informs crew of questionable $PPCO_2$ levels. (2) Ground requests that the crew check the circuit breaker.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Circuit Breaker, Magnetic "Transducer Group 2 + 5V" (3 - 83) (Panel 200) (52-79721-322) (3.9 amps) 3.19.04	L M S	a) Opens before normal break current is exceeded.	a) (1) Loss of +5 VDC power to the AM Group 2 Transducers to the Instrumentation Package 2B, and some MDA sensors. (2) The Group 1 + 5 VDC power is not affected. (3) The Instrumentation Package 2A +5 VDC power is not affected.	a) None	a) (1) Ground observes questionable (no power) data from those AM Group 2 Transducers and MDA sensors requiring +5 VDC power. (2) Ground observes questionable data for those Instrumentation Package 2B parameters which require +5 VDC power for signal conditioning.	a) N/A	---
		b) Internal defect, coil short to ground.	b) (1) Loss of data from those AM Group 2 Transducers requiring +5 VDC power. (2) Loss of data from those Instrumentation Package 2B parameters which require +5 VDC power. (3) The AM systems can be monitored with the remaining sensors. (4) Loss of data from those MDA sensors requiring +5 VDC power.	b) None	b) Ground requests that the crew check the position of the "TRANSDUCER GROUP 2 +5V" circuit breaker.	b) IIIb	
Circuit Breaker, Magnetic, "Transducer Group 1 +5 V" (3 - 71) (Panel 200) (79-79721-322) (3.9 amps) 3.19.05	L M S	a) Opens before normal break current is exceeded.	a) (1) Loss of +5 VDC power to the AM Group 1 Transducers, and to Instrumentation Package 2A. (2) The Group 2 +5 VDC power is not affected. (3) The Instrumentation Package 2B +5 VDC power is not affected.	a) None	a) (1) Ground observes questionable (no power) data from those AM Group 1 Transducers requiring +5 VDC power. (2) Ground observes questionable data for those Instrumentation Package 2A parameters which require +5 VDC power for signal conditioning.	a) N/A	---
		b) Internal defect coil short to ground.	b) (1) Loss of data from those AM Group 1 Transducers requiring +5 VDC power. (2) Loss of data from those Instrumentation Package 2A parameters which require +5 VDC power.	b) None	b) Ground requests that the crew check the position of the "TRANSDUCER GROUP 1 +5V" circuit breaker.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Switch, Toggle, "DISPLAY SIEVE A/SIEVE B" (52-79705-1) (On Panel 203) 3.19.06	M	a) Contact set (2,3) fails open in the "Sieve A" position.	a) The following indicators (located on Panel 203) cannot be switched from the Mole Sieve B sensors to the Mole Sieve A sensors: o "$PPCO_2$" o "Ht Exch" o "Dew Point" o "Bed"	a) Questionable readings are observed on the following indicators on Panel 203: o "$PPCO_2$" o "Ht Exch" o "Dew Point" o "Bed"	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) No effect on the mission. Ground can monitor all of the affected parameters except the "Bed" temperatures. The Mole Sieve A Bed can be baked-out without temperature indication.	b) (1) Crew informs ground of anomaly. (2) Crew checks the switches and circuit breakers for equipment associated with these indicators. (3) If Bed temperature indication is desired during bake-out of Sieve A, Sieves A and B can be interchanged.	b) None	b) IIIb	
This switch is used to select which Mole Sieve will be monitored by the indicators on Panel 203.	M	a) Contact set (2,1) fails open in the "Sieve B" position.	a) The following indicators (located on the Molecular Sieve Panel) cannot be switched from the Mole Sieve A sensors to the Mole Sieve B sensors: o "$PPCO_2$" o "Ht Exch" o "Dew Point" o "Bed"	a) Questionable readings are observed on the following panel indicators: o "$PPCO_2$" o "Ht Exch" o "Dew Point" o "Bed"	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) No effect on the mission. Ground can monitor all of the affected parameters except the "Bed" temperatures. The Mole Sieve B Bed can be baked-out without temperature indication.	b) (1) Crew informs ground of anomaly. (2) Crew checks the switches and circuit breakers for equipment associated with these indicators. (3) If Bed temperature indication is desired during bake-out of Sieve B, Sieves A and B can be interchanged.	b) None	b) IIIb	
	L M S	a) Contact set (2,1 or 5,6) fails open.	a) None, these contact sets are spares.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Molecular Sieve A/B Display Select Relay #1" (K3-55) (52-79703-61) 3.19.07 Functional Description: This relay provides the capability for switching the Bed Temp Indicator between Mole Sieve A and Mole Sieve B.	M	a) Reset coil fails open.	a) The "BED" indicator (located on the Molecular Sieve Panel) cannot be switched from Mole Sieve B to Mole Sieve A. This results in a loss of "BED" temperature indication during the bake-out of Mole Sieve A.	a) Crew observes indicated "BED" temperature does not increase, however, power consumption increases indicating bake-out of Mole Sieve A is proceeding.	a) None	a) N/A	— — —
		b) Defective, wire or thermal due to mechanical thermal stress.	b) (1) None. The Mole Sieve can be baked-out even though the crew has no indication of the Bed temperature. (2) Electrical power meters will indicate that bake-out is proceeding (high power consumption). (3) If excessive Bed temperature occurs, Caution indication will occur on the Caution & Warning System. (4) If Mole Sieve B has failed, Mole Sieve A can be installed in its place. This restores Bed Temperature indication.	b) (1) Crew checks the circuit breakers and switches of equipment associated with the Bed bake-out. (2) Crew observes electrical power panel indicators to verify that bake-out is proceeding. (3) Crew may replace Mole Sieve B with Mole Sieve A to restore the Bed temperature indication during bake-out.	b) None	b) IIIb	
		a) Pole A used for GSE only - No effect.	a) None	a) None	a) None	a) N/A	— — —
		a) Pole B fails open in the reset or latch position.	a) None. Redundancy provided on Pole B of Relays K3-56, -57, and -58.	a) None	a) None	a) N/A	— — —
		a) Latch coil fails open.	a) The "BED" indicator (located on the Molecular Sieve Panel) cannot be switched from Mole Sieve A to Mole Sieve B. This results in a loss of "BED" temperature indication during the bake-out of Mole Sieve B.	a) Crew observes indicated "BED" temperature does not increase, however, power consumption increases indicating bake-out of Mole Sieve B is proceeding.	a) None	a) N/A	— — —

(Continued on next page)

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Molecular Sieve A/B Display Select Relay #1" (K3-55) (52-79703-61) (Continued)	M	b) Defective wire or terminal due to mechanical or thermal stress.	b) (1) None. The Mole Sieve can be baked-out even though the crew has not indication of the Bed temperature. (2) Electrical power meters will indicate that bake-out is proceeding (high power consumption). (3) If excessive Bed temperatures occurs, Caution indication will occur on the Caution & Warning System. (4) If Mole Sieve A has failed, Mole Sieve B can be installed in its place. This restores Bed Temperature indication.	b) (1) Crew checks the circuit breakers and switches of equipment associated with the Bed bake-out. (2) Crew observes electrical power panel indicators to verify that bake-out is proceeding. (3) Crew may replace Mole Sieve A with Mole Sieve B to restore the Bed Temperature indication during bake-out.	b) None	b) IIIb	
	M	a) Pole C or Pole D fails open in the reset (or latch) position.	a) Loss of Heater Bed #2 temperature indication for Mole Sieve A (or Mole Sieve B).	a) Crew observes no power (rest position) reading on the "BED 2" indicator (located on the Molecular Sieve Panel).	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) (1) Temporary loss of Bed #2 temperature indication. (2) No effect on mission. Bed can be baked-out without temperature indication. (3) Crew can restore temperature indication of affected Bed by interchanging connectors W2J1 and W2J2 on affected Mole Sieve. Bed #2 temperature will be displayed on "BED 1" indicator.	b) (1) Crew checks the switches and circuit breakers of equipment associated with the "BED" indicators. (2) Crew interchanges connectors W2J1 and W2J2 on the affected Mole Sieve. This restores the Bed #2 temperature indication on "BED 1" indicator (located on the Molecular Sieve Panel. Note - This will result in a loss of the "SIEVE TEMP HIGH" display parameter to the Caution & Warning System. Parameter is not affected if connectors are not interchanged.	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, latching, "Molecular Sieve A/B Display Select Relay #1" (K3-55) (52-79703-61) (Continued)	M	a) Pole E or Pole F fails open in the reset (or latch) position.	a) Loss of Heater Bed #1 temperature indication for Mole Sieve A (or Mole Sieve B).	a) Crew observes no power (rest position) reading on the "BED 1" indicator (located on the Molecular Sieve Panel).	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) (1) Temporary loss of Bed #1 temperature indication. (2) No effect on mission. Bed can be baked-out without temperature indication. (3) Crew can restore temperature indication of affected Bed by interchanging connectors W2J1 and W2J2 on affected Mole Sieve. Bed #1 temperature will be displayed on "BED 2" indicator.	b) (1) Crew checks the switches and circuit breakers of equipment associated with the "BED" indicator. (2) Crew interchanges connectors W2J1 and W2J2 on the affected Mole Sieve. This restores the Bed #1 temperature indication on "BED 2" indicator (located on the Molecular Sieve Panel. Note - This will result in a loss of the "SIEVE TEMP HIGH" display parameter to the Caution & Warning System. Parameter is not affected if connectors are not interchanged.	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Molecular Sieve A/B Display Select Relay #2" (K3-56) (52-79703-61) 3.19.08	M	a) Reset coil fails open.	a) The "HT EXCH" indicator (located on the Molecular Sieve Panel) cannot be switched from Mole Sieve B to Mole Sieve A. This results in a loss of "HT EXCH" temperature display for Mole Sieve A.	a) Crew observes that the "HT EXCH" inlet and outlet readings become equal if the "DISPLAY" switch is switched from "Sieve B" to "Sieve A" and Mole Sieve B is powered down.	a) None	a) N/A	- - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) No effect on the mission. These temperatures are available on TM.	b) (1) Crew informs ground of the anomaly. (2) Crew checks the switches and circuit breakers of equipment associated with the "HT EXCH" indicator. (3) Crew requests that the ground monitor the Inlet and Outlet temperatures on TM (Seq. Nos. C205 and C206).	b) None	b) IIIb	
	M	a) Latch coil fails open.	a) The "HT EXCH" indicator (located on the Molecular Sieve Panel) cannot be switched from Mole Sieve A to Mole Sieve B. This results in a loss of "HT EXCH" temperature display for Mole Sieve B.	a) Crew observes that the "HT EXCH" inlet and outlet readings become equal if the "DISPLAY" switch is switched from "Sieve A" to "Sieve B" and Mole Sieve A is powered down.	a) None	a) N/A	- - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) No effect on the mission. These temperatures are available on TM.	b) (1) Crew informs ground of the anomaly. (2) Crew checks the switches and circuit breakers of equipment associated with the "HT EXCH" indicator. (3) Crew requests that the ground monitor the Inlet and Outlet temperatures on TM (Seq. Nos. C213 and C214).	b) None	b) IIIb	
	M	a) Pole A used for GSE only - no effect.	a) None	a) None	a) None	a) N/A	- - -
		a) Pole B fails open in the reset or latch position.	a) None. Redundancy provided on Pole B of Relays K3-55, -57 and -58.	a) None	a) None	a) N/A	- - -

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Molecular Sieve A/B Display Select Relay #2" (K3-56) (52-79703-61) (Continued)	M	a) Pole C or Pole D fails open in the reset (or latch) position.	a) Loss of Mole Sieve A (or Mole Sieve B) Heat Exchanger outlet temperature indication on the "HT EXCH OUT" indicator (located on the Molecular Sieve Panel).	a) Crew observes a no power (reset position) reading on the "HT EXCH OUT" indicator.	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) No effect on the mission. The Heat Exchanger gas outlet temperature is available on TM.	b) (1) Crew informs ground of the anomaly. (2) Crew checks the switches and circuit breakers of equipment associated with the "HT EXCH" indicator. (3) Crew requests that the ground monitor the Heat Exchanger gas outlet temperature (Seq. Nos. C206 or C214).	b) None	b) IIIb	
	M	a) Pole E or Pole F fails open in the reset (or latch) position.	a) Loss of Mole Sieve A (or Mole Sieve B) Heat Exchanger inlet temperature indication on the "HT EXCH IN" indicator (located on the Molecular Sieve Panel).	a) Crew observes a no power (rest position) reading on the "HT EXCH IN" indicator.	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) No effect on the mission. The Compressor inlet temperatures are available on TM.	b) (1) Crew informs ground of the anomaly. (2) Crew checks the switches and circuit breakers of equipment associated with the "HT EXCH" indicator. (3) Crew requests that the ground monitor the Compressor inlet temperature (Seq. Nos. C205 and C213).	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Molecular Sieve A/B Display Select Relay #3" (K3-57) (52-79703-61) 3.19.09	M	a) Reset coil fails open.	a) The "$PPCO_2$" indicator (located on the Molecular Sieve Panel) cannot be switched from Mole Sieve B to Mole Sieve A. This results in a loss of the "$PPCO_2$" indicator for Mole Sieve A.	a) Crew observes that the "$PPCO_2$" inlet and outlet readings become equal if the "DISPLAY" switch is switched from "SIEVE B" to "SIEVE A" and Mole Sieve B is powered down.	a) None	a) N/A	- - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) No effect on the mission. The $PPCO_2$ levels are available on TM.	b) (1) Crew informs ground of the anomaly. (2) Crew checks the circuit breakers and switches of equipment associated with the $PPCO_2$ indicators. (3) Crew requests that the ground monitor the $PPCO_2$ levels of Mole Sieve A.	b) None	b) IIIb	
	M	a) Latch coil fails open.	a) The "$PPCO_2$" indicator (located on the Molecular Sieve Panel) cannot be switched from Mole Sieve A to Mole Sieve B. This results in a loss of the "$PPCO_2$" indicator for Mole Sieve B.	a) Crew observes that the "$PPCO_2$" inlet and outlet readings become equal if the "DISPLAY" switch is switched from "SIEVE A" to "SIEVE B" and Mole Sieve A is powered down.	a) None	a) N/A	- - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) No effect on the mission. The $PPCO_2$ levels are available on TM.	b) (1) Crew informs ground of the anomaly. (2) Crew checks the circuit breakers and switches of equipment associated with the $PPCO_2$ indicators. (3) Crew requests that the ground monitor the $PPCO_2$ levels of Mole Sieve B.	b) None	b) IIIb	
	M	a) Pole A used for GSE only - No effect.	a) None	a) None	a) None	a) N/A	- - -
		a) Pole B fails open in the reset or latch position.	a) None. Redundancy provided on Relays K3-55, -56 and -58.	a) None	a) None	a) N/A	- - -

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Molecular Sieve A/B Display Select Relay #3" (K3-57) (52-79703-61) (Continued)	M	a) Pole C or Pole D fails open in the reset (or latch) position.	a) Loss of Mole Sieve A (or Mole Sieve B) $PPCO_2$ outlet readings on the "$PPCO_2$ OUT" indicator (located on the Molecular Sieve Panel).	a) Crew observes a no power (rest position) reading on the "$PPCO_2$ OUT" indicator.	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) No effect on the mission. The Molecular Sieve outlet $PPCO_2$ level is available on TM (Seq. Nos. D210 and D214).	b) (1) Crew informs ground of the anomaly. (2) Crew checks the circuit breakers and switches of equipment associated with obtaining the $PPCO_2$ reading. (3) Crew requests that the ground monitor the "Mole Sieve A (or B) - $PPCO_2$ Outlet" level (Seq. Nos. D210 or D214).	b) None	b) IIIb	
	M	a) Pole E or Pole F fails open in the reset (or latch) position.	a) Loss of Mole Sieve A (or Mole Sieve B) $PPCO_2$ inlet readings on the "$PPCO_2$ IN" indicator (located on the Molecular Sieve Panel).	a) Crew observes a no power (rest position) reading on the "$PPCO_2$ IN" indicator.	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) No effect on the mission. The Molecular Sieve inlet $PPCO_2$ level is available on TM (Seq. Nos. D209 or D213).	b) (1) Crew informs ground of the anomaly. (2) Crew checks the circuit breakers and switches of equipment associated with obtaining the $PPCO_2$ reading. (3) Crew requests that the ground monitor the "Mole Sieve A (or B) - $PPCO_2$ Inlet" level (Seq. Nos. D209 or D213).	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Molecular Sieve A/B Display Select Relay #4" (K3-58) (52-79703-61) 3.19.10	M	a) Reset coil fails open.	a) The "DEW POINT" indicator (located on the Molecular Sieve Panel) cannot be switched from Mole Sieve B to Mole Sieve A. This results in a loss of the "DEW POINT" temperature display for Mole Sieve A.	a) Questionable dew point readings.	a) If the crew reports dew point temperature to the ground, reported reading does not agree with the TM reading.	a) N/A	- - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) No effect on the mission. The dew point temperature can be monitored on TM (Seq. No. C207).	b) Crew informs the ground of the anomaly.	b) (1) Ground informs crew of the anomaly. (2) Ground requests that the crew check the switches and circuit breakers for equipment associated with obtaining the dew point temperature. (3) Ground continues to monitor the dew point temperature on TM.	b) IIIb	
	M	a) Latch coil fails open.	a) The "DEW POINT" indicator (located on the Molecular Sieve Panel) cannot be switched from Mole Sieve A to Mole Sieve B. This results in a loss of the "DEW POINT" temperature display for Mole Sieve B.	a) None	a) If the crew reports dew point temperature to the ground, reported reading does not agree with the TM reading.	a) N/A	- - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) No effect on the mission. The dew point temperature can be monitored on TM (Seq. No. C215).	b) Questionable dew point readings.	b) (1) Ground informs crew of the anomaly. (2) Ground requests that the crew check the switches and circuit breakers for equipment associated with obtaining the dew point temperature. (3) Ground continues to monitor the dew point temperature on TM.	b) IIIb	
	M	a) Pole A used for GSE only - No effect.	a) None	a) Crew informs the ground of the anomaly.	a) None	a) N/A	- - -

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Molecular Sieve A/B Display Select Relay #4" (K3-58) (52-79703-61) (Continued)	M	a) Pole B fails open in the reset or latch position.	a) None. Redundancy provided on Pole B of Relays K3-55, -56 and -57.	a) None	a) None	a) N/A	- - -
	M	a) Pole C and Pole D are spares - No effect.	a) None	a) None	a) None	a) N/A	- - -
	M	a) Pole E or Pole F fails open in the reset (or latch) position.	a) Loss of Mole Sieve A (or Mole Sieve B) dew point temperature indication on the "DEW POINT" indicator (located on the Molecular Sieve Panel).	a) Crew observes a no power (rest position) reading on the "DEW POINT" indicator.	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) No effect on the mission. The dew point temperature is available on TM.	b) (1) Crew informs crew of the anomaly. (2) Crew checks the switches and circuit breakers of equipment associated with the "DEW POINT" indicator. (3) Crew requests that the ground monitor the dew point temperature (Seq. Nos. C207 and C215).	b) Ground may request that the crew switch to the other mole sieve.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW c) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "Molecular Sieve A/B Display Select Relay #5" (K3-59) (52-79715-13) 3.19.11	M	a) With Relays K3-55, -56, -57, and -58 in the reset position; (1) Coil fails open, or (2) Pole B fails open when coil is energized.	a) Relays K3-55, -56, -57 and -58 cannot be cycled to the latch position. As a result, the following panel indicators (located on the Molecular Sieve Panel) cannot be switched from Mole Sieve A sensors to Mole Sieve B sensors: • "$PPCO_2$" • "Ht Exch" • "Dew Point" • "Bed"	a) Crew observes questionable readings on the following panel indicators: • "$PPCO_2$" • "Ht Exch" • "Dew Point" • "Bed"	a) None	a) N/A	— — —
This relay is used when selecting which mole sieve the indicators on Panel 203 will monitor.		b) (1) Defective wire or terminal due to mechanical or thermal stress, or (2) Insulating film on contacts due to contamination.	b) No effect on the mission. Ground can monitor all of the affected parameters except the "Bed" temperatures. The Mole Sieve Bed can be baked-out without temperature indication.	b) (1) Crew informs ground of anomaly. (2) Crew checks the switches and circuit breakers for equipment associated with these indicators. (3) If Bed temperature indication during bake-out is desired, Sieves A and B can be interchanged so that Sieve B bake-out can be monitored on the "Bed" indicator.	b) None	b) IIIb	
	M	a) With Relays K3-55, -56, -57, and -58 in the latch position; (1) Coil fails open when coil is energized. (2) Pole A fails open when coil is energized. (Continued on next page)	a) Relays K3-55, -56, -57, and -58 cannot be cycled to the reset position. As a result, the following panel indicators (located on the Molecular Sieve Panel) cannot be switched from Mole Sieve B sensors to Mole Sieve A sensors: • "$PPCO_2$" • "Ht Exch" • "Dew Point" • "Bed"	a) Crew observes questionable readings on the following panel indicators: • "$PPCO_2$" • "Ht Exch" • "Dew Point" • "Bed"	a) None	a) N/A	— — —

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release "Molecular Sieve A/B Display Select Relay #5" (K3-59) (52-79703-61) (Continued)		b) (1) Defective wire or terminal due to mechanical or thermal stress, or (2) Insulating film on contacts due to contamination.	b) No effect on the mission. Ground can monitor all of the affected parameters except the "Bed" temperatures. The Mole Sieve Bed can be baked-out without temperature indication.	b) (1) Crew informs ground of anomaly. (2) Crew checks the switches and circuit breakers for equipment associated with these indicators. (3) If Bed temperature indication during bake-out is desired, Sieves A and B can be interchanged so that Sieve A bake-out can be monitored on the "Bed" indicator.	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Temperature Sensor, (52-88721-195) (Any one of four) 3.19.12 thru 3.19.15 This sensor is used to measure the FAS Inner Skin Temperatures.	L M S	a) Erroneous output.	a) Loss of one of the FAS Inner Skin temperatures.	a) None	a) Ground observes questionable reading on TM readout from affected sensor. Sequence number C243, C241, C242 or C240.	a) N/A	----
		b) Electrical mechanical abuse.	b) None. Three of four sensors considered sufficient for mission completion.	b) None	b) None	b) III b	
Temperature Sensor, (52-88721-19) (Any one of three) 3.19.16 3.19.17 3.19.18 This sensor used to measure the STS Inner Skin, Lock Inner Skin and Aft compt. Inner Skin temperatures.	L M S	a) Erroneous output.	a) Incorrect TM readout from the affected sensor.	a) None	a) Ground observes questionable reading on TM readout from affected sensor. Sequence number C237, C238, or C239.	a) N/A	----
		b) Electrical, mechanical abuse.	b) None. One of three sensors considered sufficient for mission completion.	b) None	b) None		

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Condensate Dump PRI/SEC Display Select Relay #1" (K3-328) (52-79703-61)	M	a) Pole for Pole E fails open in the reset or latch position.	a) None - These poles are spares.	a) None	a) None	a) N/A	-----
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	-----
3.19.19	M	a) Pole D or Pole C fails open in the reset position.	a) Loss of power from the condensate dump Pri temp sensor to the "VENT TEMP" indicator located on Panel 216.	a) Crew observes zero reading on the "VENT TEMP" indicator (located on Panel 216).	a) None	a) N/A	-----
		b) Insulating film on contacts due to contamination.	b) None	b) Crew switches to the secondary vent.	b) None	a) N/A	-----
	M	a) Pole D or Pole C fails open in the latch position.	a) Loss of power from the condensate dump Sec temp sensor to the "VENT TEMP" indicztor located on Panel 216.	a) Crew observes zero reading on the "VENT TEMP" indicator (located on Panel 216).	a) None	a) N/A	-----
		b) Insulating film on contacts due to contamination.	b) None	b) Crew switches to the primary vent.	b) None	b) IIIb	
	L M S	a) Pole A fails open in the re-set or latch position.	a) None - GSE use only.	a) None	a) Non	a) N/A	-----
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Condensate Dump PRI/SEC Display Select Relay #1" (K3-328) (52-79703-61) (Continued)	M	a) (1) Latch coil fails open, or (2) Pole B fails open in the reset position.	a) Crew cannot monitor the Sec Vent temperature if relay K3-328 is in the reset position.	a) When crew switches the "VENT HEATERS" switch to the "SEC" position, a zero reading is observed on the "VENT TEMP" indicator (located on Panel 216).	a) None	a) N/A	-----
		b) (1) Defective wire or therminal due to mechanical or thermal stress. (2) Insulating film on contacts due to contamination.	b) None	b) (1) Crew informs ground of the anomaly. (2) Crew can observe tank to determine if condensate is dumping. (3) Crew can switch to Pri Vent.	b) None	b) IIIb	
	M	a) (1) Reset coil fails open, or (2) Pole B fails open in the latch position.	a) Crew cannot monitor the Pri vent temperature if Relay K3-328 is in the latch position.	a) When crew switches the "VENT HEATERS" switch to the "PRI" position, a zero reading is observed on the "VENT TEMP" indicator (located on Panel 216).	a) None	a) N/A	-----
		b) (1) Defective wire or terminal due to mechanical or thermal stress (2) Insulating film on contacts due to contamination.	b) None	b) (1) Crew informs ground of the anomaly. (2) Crew can observe tank to determine if condensate is dumping. (3) Crew can switch to Sec Vent.	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "Condensate Dump PRI/SEC Display Select Relay #2" (K3-329) (52-79715-13) 3.19.20	M	a) With Relay K3-328 in the reset position; (1) Pole B fails open when the coil is energized, or (2) The coil fails open.	a) Crew cannot monitor the Sec Vent Temp.	a) When the crew switches the "VENT HEATERS" switch to the "SEC" position, a zero reading is observed on the "VENT TEMP" indicator (located on Panel 216).	a) None	a) N/A	-----
		b) (1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to contamination.	b) None	b) (1) Crew informs ground of the anomaly. (2) Crew can observe tank to determine if condensate is dumping. (3) Crew can switch to the PRI Vent.	b) None	b) IIIb	
	M	a) With Relay K3-328 in the latch position; (1) Pole A fails open when the coil is energized, or (2) The coil fails open.	a) Crew cannot monitor the Pri vent temp.	a) When the crew switches the "VENT HEATERS" switch to the "PRI" position, a zero reading is observed on the "VENT TEMP" indicator (located on Panel 216).	a) None	a) N/A	-----
		b) (1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) None	b) (1) Crew informs ground of the anomaly. (2) Crew can observe tank to determine if condensate is dumping. (3) Crew can switch to the SEC Vent.	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Circuit Breaker, Magnetic, "Suit Umbilical System 1 EVA OCU-1" (3-13) (52-79721-320) (5.4 Amps) (On Panel 202) 3.20.01 or Circuit Breaker, Magnetic, "Suit Umbilical System 1 EVA OCU-2" (3-14) (52-79721-320) (5.4 Amps) (On Panel 202) 3.20.02	M	a) One of these breakers opens before normal break current is exceeded.	a) None - Redundancy is provided by the other circuit breaker.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Internal defect, coil short to ground.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Circuit Breaker, Magnetic "Suit Umbilical System 2 EVA CCU-1" (3-113) (52-79721-320) (5.4 Amps) (On Panel 202) 3.20.03 Or Circuit Breaker, Magnetic, "Suit Umbilical System 2 EVA CCU-2" (3-112) (52-79721-320) (5.4 Amps) (On Panel 202) 3.20.04	M	a) One of these breakers opens before normal break current is exceeded.	a) None - Redundancy is provided by the other circuit breaker.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Internal defect, coil short to ground.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Switch, Toggle, "Suit Umb Sys 1 LSU Power On/Off" (52-79705-129) (Located on Panel 317) 3.20.07 or Switch, Toggle, "Suit Umb Sys 2 LSU Power On/Off" (52-79705-129) (Located on Panel 323) 3.20.10	M	a) Contact set (2, 3) fails open in the "ON" position.	a) None - Redundancy is provided by contact set (5, 6) of this switch.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	M	a) Contact set (5, 6) fails open in the "ON" position.	a) None - Redundancy is provided by contact set (2,3) of this switch.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	M	a) Contact set (2, 1 or 5, 4) fails open in the "off" position.	a) None - These contact sets are not functional.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
DC-DC Converter Temperature Sensor (52-88721-19) (Any 1 of 3) 3.21.01 3.21.02 3.21.03	L M S	a) Erroneous output (high or low).	a) Failure will not damage Converter or other PCM equipment, however, TM monitoring of Converter temperature is lost.	a) None	a) Ground observes questionable Converter temperature.	a) N/A	- - -
		b) Component failure due to mechanical stress.	b) (1) None. Converter temperature not necessary for mission completion. (2) If temperature reading is high, ground may elect to switch to alternate Converter.	b) None	b) (1) If questionable temperature is for powered-up Converter, ground switches to an alternate Converter. Converter temperature readout remains questionable. Ground concludes that Converter temp sensor is faulty.	b) IIIb	
Telemetry Transmitter Temperature Sensor (52-88721-3) (Any 1 of 4) 3.21.04 thru 3.21.07	L M S	a) Erroneous output (high or low).	a) Failure will not damage the Transmitter or other PCM equipment, however, TM monitoring of the Transmitter temperature is lost.	a) None	a) Ground observes questionable Transmitter temperature.	a) N/A	
		b) Component failure due to mechanical stress.	b) (1) None. Transmitter temperature not necessary for mission completion. (2) If temperature reading is high, ground may elect to switch to an alternate transmitter.	b) None	b) (1) If questionable temperature is for powered-up Transmitter, ground switches to alternate Transmitter. Transmitter temperature readout remains questionable. Ground concludes that Transmitter temp sensor is faulty.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Circuit Breaker, Magnetic, "LNCH TM" (3-11) (52-79721-322) (3.9 amps) (on Panel 202) 3.21.08	L	a) Opens before normal break current is exceeded.	a) (1) Loss of power for TM indication that the Discone Antennas are deployed and locked. (2) Loss of power to the following xducers: o OWS Film Vault Longitudinal Vibration Xducer. o Payload Shroud Acoustic and Vibration Xdurcers. o STS X Axis Vibration Sensor.	a) None	a) (1) Indication that the Discone Antennas have not deployed (K102, K167 and K168). (2) Loss of data from the following Xducers: o OWS Film Vault Longitudinal Vibration Xducer. o Payload Shroud Acoustic and Vibration Xducers. o STS X Axis Vibration Sensor.	a) N/A	- - -
		b) Internal defect, coil short to ground.	b) None. Loss data is not essential for mission continuation.	b) None	b) Ground can determine from the strength of the TM signals whether the Discone Antennas have deployed. If signals continue good, ground assumes antennas have locked in the deployed condition.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
			See page 3.21.2 for analysis of Other equipment and/or circuits	circuit breaker 3 - 11. not used for flight.			

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Switch, Rotary, "O_2 Bottle Sw." (located on Panel 225) (52-79706-27) 3.23.01 This switches enables the crew to select which O_2 tank pressure and temperature will be displayed on the panel indicator.	M	a) Contact set (10, 11 or 20, 21 or 30, 31 or 40, 41) fails open in the "OFF" position.	a) None. Contacts are not functional in the "OFF" position.	a) None	a) None	a) N/A	- - -
		a) Contact sets (10, 12 or 20, 22) or (30, 32 or 40, 42) fail open in the "1" position.	a) Loss of O_2 Bottle #1 temperature or pressure display.	a) Crew observes no power (rest position) reading on the O_2 temperature or pressure indication.	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None. The O_2 Bottle temperatures and pressures are available on TM.	b) Crew informs ground of the anomaly.	b) Ground coordinates with crew by providing TM readout of lost parameter.	b) IIIb	
		a) Contact sets (10, 13 or 20, 23) or (30, 33 or 40, 43) fail open in the "2" position.	a) Loss of O_2 Bottle #2 temperature or pressure display.	a) Crew observes no power (rest position) reading on the O_2 temperature or pressure indication.	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None. The O_2 Bottle temperatures and pressures are available on TM.	b) Crew informs ground of the anomaly.	b) Ground coordinates with crew by providing TM readout of lost parameter.	b) IIIb	
		a) Contact sets (10, 14 or 20, 24) or (30, 34 or 40, 44) fail open in the "3" position.	a) Loss of O2 Bottle #3 temperature or pressure display.	a) Crew observes no power (rest position) reading on the O_2 temperature or pressure indication.	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None. The O_2 Bottle temperatures and pressures are available on TM.	b) Crew notifies ground of anomaly.	b) Ground coordinates with crew by providing TM readout of lost parameter.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Switch, Rotary "O_2 Bottle Sw." (located on Panel 225) (52-79706-57 (Continued)	M	a) Contact sets (10,15 or 20,25) or (30,35 or,40, 45) fail open in the "4" position.	a) Loss of O_2 Bottle #4 temperature or pressure display.	a) Crew observes no power (rest position) reading on the O_2 temperature or pressure indication.	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None. The O_2 Bottle temperature and pressures are available on TM.	b) Crew informs ground of the anomaly.	b) Ground coordinates with crew by providing TM readout of lost parameter.	b) IIIb	
	M	a) Contact sets (10, 16 or 20, 26) or (30, 36 or 40, 46) fail open in the "5" position.	a) Loss of O_2 Bottle #5 temperature or pressure display.	a) Crew observes no power (rest position) reading on the O_2 temperature or pressure indication.	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None. The O_2 Bottle temperatures and pressures are available on TM.	b) Crew informs ground of the anomaly.	b) Ground coordinates with crew by providing TM readout of lost parameter.	b) IIIb	
	M	a) Contact sets (10, 17 or 20, 27) or (30, 37 or 40, 47) fail open in the "6" position.	a) Loss of O_2 Bottle #6 temperature or pressure display.	a) Crew observes no power (rest position) reading on the O_2 temperature or pressure indication.	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None. The O_2 Bottle temperatures and pressures are available on TM.	b) Crew informs ground of the anomaly.	b) Ground coordinates with crew by providing TM readout of lost parameter.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND. a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Switch, Rotary, "N_2 Bottle Sw." (located on Panel 225) (52-79706-57 3.23.02 This switch enables the crew to select which N_2 tank pressure and temperature will be displayed on the panel indicator.	M	a) Contact set (10, 11 or 20, 21 or 30, 31 or 40, 41) fails open in the "OFF" position.	a) None. Contacts are not functional in the "OFF" position.	a) None	a) None	a) N/A	- - -
		a) Contact sets (10, 12 or 20, 22) or (30,32 or 40, 42) fail open in the " 1" position.	a) Loss of N_2 Bottle #1 pressure or temperature display.	a) Crew observes no power (rest position) reading on the N_2 pressure or temperature indicator.	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None. N_2 Bottle pressures and temperatures are available on TM.	b) Crew notifies ground of anomaly.	b) Ground coordinates with crew by providing TM readout of lost parameter.	b) IIIb	
		a) Contact sets (10, 13 or 20, 23) or (30, 33 or 40, 43) fail open in the "2" position.	a) Loss of N_2 Bottle #2 pressure or temperature display.	a) Crew observes no power (rest position) reading on the N_2 pressure or temperature indicator.	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None. N_2 Bottle pressures and temperatures are available on TM.	b) Crew notifies ground of anomaly.	b) Ground coordinates with crew by providing TM readout of lost parameter.	b) IIIb	
		a) Contact sets (10, 14 or 20, 24) or (30, 34 or 40, 44) fail open in the "3" position.	a) Loss of N_2 Bottle #3 pressure or temperature display.	a) Crew observes no power (rest position) reading on the N_2 pressure or temperature indicator.	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None. N_2 Bottle pressures and temperatures are available on TM.	b) Crew notifies ground of anomaly.	b) Ground coordinates with crew by providing TM readout of lost parameter.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Switch, Rotary, "N_2 Bottle Sw." (located on Panel 225) (52-79706-57 (Continued)	M	a) Contact sets (10, 15 or 20, 25) or (30, 35 or 40, 45) fail open in the "4" position.	a) Loss of N_2 Bottle #4 pressure or temperature display.	a) Crew observes no power (rest position) reading on the N_2 pressure or temperature indicator.	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None. N_2 Bottle pressures and temperatures are available on TM.	b) Crew notifies ground of anomaly.	b) Ground coordinates with crew by providing TM readout of lost parameter.	b) IIIb	
		a) Contact sets (10, 16 or 20, 26) or (30, 36 or 40, 46) fail open in the "5" position.	a) Loss of N_2 Bottle #5 pressure or temperature display.	a) Crew observes no power (rest position) reading on the N_2 pressure or temperature indicator.	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None. N_2 Bottle pressures and temperatures are available on TM.	b) Crew notifies ground of anomaly.	b) Ground coordinates with crew by providing TM readout of lost parameter.	b) IIIb	
		a) Contact set (10, 17 or 20,27) or (30, 37 or 40, 47) fail open in the "6" position.	a) Loss of N_2 Bottle "6 pressure or temp. display.	a) Crew observes no power (rest position) reading on the N_2 pressure or temperature indicator.	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None. N_2 Bottle pressures and temperatures are available on TM.	b) Crew notifies ground of the anomaly.	b) Ground coordinates with crew by providing TM readout of lost parameter.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Quartz Crystal Microbalance Instrument, 61B880062 3.24.01 thru 3.24.04 (any 1 of 4) These sensors are used for the following TM sequence numbers: MO17, MO20, MO23 and MO26.	L M S	a) Erroneous output.	a) None	a) None	a) Questionable TM data is received from the affected sensor.	a) N/A	---
		b) Defective component due to mechanical or thermal stress.	b) None, other than the loss of QCM data from the affected sensor.	b) None	b) None	b) IIIb	
Acoustic Noise Transducer, 61B880063 3.24.05	L	a) Loss of output.	a) None	a) None	a) Loss of related TM parameter.	a) N/A	---
		b) Defective Component due to mechanical or thermal stress.	b) None, other than the loss of related acoustic noise measurement from the Payload Shroud Segment 1 Bus 2.	b) None	b) None	b) IIIb	
Vibration Measuring Sensor 61B880064 3.24.06 3.24.07 3.24.08	L	a) Loss of output.	a) None	a) None	a) Loss of related TM parameter.	a) N/A	---
		b) Mechanical or Thermal Stress.	b) None, other than the loss of related vibration measurement from the Payload Shroud Segment 3 Bus 2, the STS X axis or the OWS Film Vault.	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Circuit Breaker, Magnetic, "TRANSDUCER GROUP 1 - 1" (3-47) (52-79721-322) (Rated at 3.9 amps) (on Panel 200) 3.25.01	L M S	a) Opens before normal break current is exceeded.	a) (1) Loss of AM Bus 1 power to the following sensors: o Water System #1 Flowmeter o Pri Coolant Control Valve CVPA Flowmeter o Sec Coolant Control Valve CVSB Flowmeter (2) Loss of power to the ATM SAS for TM bi-level indication that the Wings are deployed and locked. (3) Loss of power for TM indication of the position of MDA Vent Valve #1 and for TM indication of whether some of the MDA Tunnel, Port and Wall Heaters are ON or OFF.	a) None	a) (1) Ground observes zero flow rate for parameters F206, F212, F215. (2) Ground receives indication that the ATM Wings are deployed and locked (M501 thru M508). This discrepancy significant only if wings have not yet been deployed. (3) Ground receives indication that the following MDA heaters are continuously powered: o Wall Heaters 5-8 Sec and 9-12 Sec (M087/M088). o Wall Heaters 1-4 Pri and 13-16 Pri (M054/M055). (4) Ground receives indication that the Pri CSM Dock Port Htr (M052) and the Pri Spare Dock Port Htr (M053) are not powered. (5) TM indicates MDA Vent Valve #1 is both OPEN and CLOSED.	a) N/A	- - - - - - - - - -
		b) Internal defect, coil short to ground.	b) None	b) Upon request from ground, crew opens circuit breakers of Wall Heaters which are continuously powered.	b) (1) Ground must use alternate means to determine in the Wings have deployed. (2) Redundant parameters (Temp/Pressure) must be used to determine that Water System #1 has sufficient flow. (3) Ground requests that crew check the affected heaters. (4) Ground studies cabin pressure indications to determine if Vent Valve #1 is open or closed.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Circuit Breaker, Magnetic, "TRANSDUCER GROUP 1 - 1" (3-58) (52-79721-322) (Rated at 3.9 amps) (on Panel 200) 3.25.02	L M S	a) Opens before normal break current is exceeded.	a) (1) Loss of AM Bus 2 power to the following sensors: o Water System #2 Flowmeter o Pri Coolant Control Valve CVPB Flowmeter. o Sec Coolant Control Valve CVSA Flowmeter o ATM C&D Panel Coolant Flowmeter. (2) Loss of Power for TM indication of the position of MDA Vent Valve #2 and for TM indication of whether some of the MDA tunnel, Port and Wall heaters are ON or OFF.	a) None	a) (1) Ground observes zero flow rate for parameters F207, F214, F213 and F208. (2) Ground receives indication that the following MDA heaters are continuously powered: o Wall Heaters 1-4 Sec and 13-16 Sec (N085/N086). o Wall Heaters 5-8 Pri and 9-12 Pri (N056/N057). o Sec CSM Dock Port Htr (N048) and Sec Spare Dock Port Htr (N049) (3) TM indicates MDA Vent Valve #2 is both OPEN and CLOSED.	a) N/A	- - - - - - - - - -
		b) Internal defect, coil short to ground.	b) None	b) None	b) (1) Redundant parameters (Temp/Pressure) must be used to determine that Water System #2 has sufficient flow. (2) Ground requests that the crew check the affected heaters. (3) Ground studies cabin pressure indications to determine if Vent Valve #2 is open or closed. (4) Ground requests that the crew check the affected heaters.	b) IIIb	

ANALYSIS OF SECOND FAILURES

INSTRUMENTATION SYSTEM

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
			FIRST FAILURE				
Relay, Latching, "Conv. Cntl. Mode Relay #2" (K3-11) 3.1.42	L M S	a) Pole C (or Pole E) fails open in the reset position.	a) None	a) None	a) None	a) N/A	------
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
			SECOND FAILURE				
This relay is used for manual or DCS control of the Conv/Bus operating mode. Bus A and Bus B -24 VDC power passes through this relay.	L M S	a) Pole E (or Pole C) fails open in the reset position.	a) There is a loss of -24 VDC Bus B power.	a) None	a) The -24 VDC Bus B Monitor.	a) N/A	------
		b) Insulating film on contacts due to contamination.	b) None, -24 VDC Bus B power is not used during a normal mission.	b) None	b) (1) Ground can request that the crew switch to the manual mode for selection on Conv/Bus operating mode.	b) IIIb	
			FIRST FAILURE				
	L M S	a) Pole D (or Pole F) fails open in the reset position.	a) None	a) None	a) None	a) N/A	------
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
			SECOND FAILURE				
	L M S	a) Pole F (or Pole D) fails open in the reset position.	a) There is a loss of -24 VDC Bus A power. This results in a loss of power to the PCM System.	a) Erroneous reading on the "PPCO$_2$ IN" indicator (located on the Molecular Sieve Panel, Panel 203). The "PPCO$_2$ OUT" indicator is not affected.	a) Loss of TM data.	a) N/A	------

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
			SECOND FAILURE				
Relay, Latching, "Conv. Cntl. Mode Relay #2" (K3-11) 3.1.42 (Continued)		b) Insulating film on contacts due to contamination.	b) None. Ground can perform switching to circumvent the problem.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew informs the ground of the anomaly.	b) The ground switches to Bus B power for the PCM System and the Instrumentation System Group 1 and Group 2 Transducers.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
			FIRST FAILURE				
Relays, Latching, "DCS Converter Select Relay #6" (K3-334) (52-79703-53) 3.1.53	L M S	a) Pole C (or Pole D) in one of these relays fails open in the reset position.	a) None	a) None	a) None	a) N/A	------
and		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
"DCS Converter Select Relay #8" (K3-336) (52-79703-53) 3.1.55			SECOND FAILURE				
and		a) Pole D (or Pole C) in one of these relays fails open in the reset position, i.e. one Pole C and one Pole D have failed open in the reset position.	a) There is a loss of +24 VDC Bus A power. This results in a loss of power to the Prime Data Recorder and to those sensors using +24 VDC Bus A power.	a) (1) The following panel indicators assume the no power (rest) position: o The "PPCO2" and "HT EXCH" indicators (located on the STS Molecular Sieve Panel, Panel 203). o The O_2/N_2 bottle temperature indicators (located on the STS O_2/N_2 Control System Panel, Panel 225). o The "TANK ΔP" and "VENT TEMP" indicators (located on the STS Condensate Control Panel, Panel #216). (2) The "DATA RECORD" light (located on the STS Instrumentation System Panel, Panel 204) does not light when the crew switches the "TAPE RECORDING DATA" switch (located on Panel 204) to the "RECORD" position.	a) (1) The ground observes the following on TM: o No power readings from those sensors requiring +24 VDC Bus A power. o Oscillatory readings from those sensors requiring +5 VDC Bus A power. o Zero reading on the +24 VDC Bus A monitor channel (M511). o Oscillatory reading on the +5 VDC Bus A monitor channel (M513). o Questionable data for those parameters requiring +24 and/or +5 volt power for signal conditioning. (2) Loss of data from the Prime Data T/R.	a) N/A	------
Relay, Latching, "Converter Control Mode Relay #5" (K3-337) (52-79703-53) 3.1.56							

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Converter Select Relay #6" (K3-334) (52-79703-53) and "DCS Converter Select Relay #8" (K3-336) (52-79703-53) and "Converter Control Mode Relay #5" (K3-337) (52-79703-53)	L M S	b) Insulating film on contacts due to contamination.	b) None other than a temporary loss of data from the Prime Data T/R and from those sensors requiring +24 VDC Bus A power. The ground or crew can select an alternate Conv/Bus operating mode.	b) (1) Crew positions the "LIGHTING STATUS" switch (located on Panel 207) to the "TEST" position. "RECORD" light tests good. (2) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (3) Crew informs ground of the anomaly.	b) (1) Ground informs crew of the anomaly. (2) Ground switches to an alternate Conv/Bus operating mode (1A/3B or 2A/1B) or requests that the crew manually switch to an alternate Conv/Bus operating mode (1 & 2 or 1 & 3 or 2 & 1 or 3 & 2).	b) IIIb	
			FIRST FAILURE				
	M	a) Pole E (or Pole F) in one of these relays fails open in the reset position.	a) None. Pole F (or Pole E) of the relay with the open contact provides redundancy.	a) None	a) None	a) N/A	------
(Continued)		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
			SECOND FAILURE				
		a) Pole F (or Pole E) in one of these relays fails open in the reset position, i.e. one Pole E and one Pole F have failed open in the reset position.	a) There is a loss of +24 VDC Bus B power. This results in a loss of power to the Experiment Tape Recorders.	a) The STS and OWS "EXP 1 RECORD" and/or "EXP 2 RECORD" lights do not light up when the crew switches respective STS or OWS Experiment Record switch to the "RECORD" position.	a) (1) Ground observes a loss of data from Experiment T/R's. (2) Ground observes the following on TM: o T/R 2 and/or T/R 3 Tape Motion Monitor channels (K509 and/or K510) indicate no tape motion. o The +24 VDC Bus B monitor channel (M520) indicates loss of power.	a) N/A	------

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relays, Latching, "DCS Converter Select Relay #6" (K3-334) (52-79703-53) and "DCS Converter Select Relay #8" (K3-336) (52-79703-53) and "Converter Control Mode Relay #5" (K3-337) (52-79703-53) (Continued)		b) Insulating film on contacts due to contamination.	b) None other than a temporary loss of Experiment 1 and/or Experiment 2 Data. The ground or the crew can select an alternate Conv/Bus operating mode.	b) (1) Crew positions the "LIGHTING STATUS" switch (located on Panel 207) to the "TEST" position. The STS Exp 1 & Exp 2 "RECORD" lights test good. (2) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (3) Crew informs ground of the anomaly.	b) (1) Ground informs crew of the anomaly. (2) Ground switches to an alternate Conv/Bus operating mode (1A/3B or 2A/1B or 3A/2B) or requests that the crew manually switch the Conv/Bus operating mode (1 & 2 or 1 & 3 or 2 & 1 or 3 & 2).	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
			FIRST FAILURE				
Relays, Latching, "DCS Exp 2 Dump Relay #2" (K3-291) (52-79703-45) 3.2.46	L M S	a) Pole B of one of these relays fails open in the reset position.	a) None - Redundancy is provided by Pole B of the other relay.	a) None	a) None	a) N/A	------
and							
"DCS Exp 2 Dump Relay #3" (K3-290) (52-79703-53) 3.2.45		b) Contamination	b) None	b) None	b) None	b) IIIb	
			SECOND FAILURE				
	L M S	a) Pole B of the other relay fails open in the reset position.	a) There is a loss of DCS capability to dump to Exp 2 Rcdr.	a) None	a) (1) When the Exp 2/Data 2 Dump Enable ON command (12-2), the carrier wave is not received from the Xmtr. which has been designated for transmitting Exp 2 Rcdr. data. (2) The appropriate DCS verification channel indicates the dump command has been correctly received and decoded by the DCS. (3) The Exp Rcdr. Bus voltage monitor channels indicate zero volts. (4) The Exp 2 Rcdr. tape motion monitor channel indicates no tape motion.	a) N/A	------
		b) Contamination	b) There is a loss of recorded Data 2 (subframe 4) during unmanned phases.	b) None	b) (1) The ground requests that the crew manually dump the Exp 2 Rcdr.	b) IIIb	
			FIRST FAILURE				
	L S	a) Pole B of one of these relays fails open in the latch position.	a) None - Redundancy is provided by Pole B of the other relay.	a) None	a) None	a) N/A	------
		b) Contamination	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
			SECOND FAILURE				
Relays, Latching, "DCS Exp 2 Dump Relay #2" (K3-291) (52-79703-45) and "DCS Exp 2 Dump Relay #3" (K3-290) (52-79703-53) (Continued)	L S	a) Pole B of the other relay fails open in the latch position.	a) When the Exp 2/Data 2 Dump Enable OFF command (12-2) is given, power is not removed from Xmtr A. If ground has commanded R/T TM ON, power is applied to Xmtr B even though data is not being transmitted on Xmtr B. Also, power is not removed from the Exp Rcdr Conv and the Exp 2 Rcdr.	a) None	a) (1) Carrier wave is received from the Xmtr which is powered-up but not transmitting data. (2) The Exp Rcdr Bus voltage monitor channels (normally M520, M521, & M522) indicate the Exp Rcdr Conv is powered-up. (3) If the end-of-tape has not been reached, the Exp 2 Rcdr tape motion monitor channel (normally K510) indicates there is tape motion. (4) The appropriate DCS verification channels indicate the commands have been correctly received & decoded by the DCS.	a) N/A	------
		b) Contamination	b) Excessive operating time on the Exp 2 Rcdr may necessitate premature replacement of the Rcdr.	b) None	b) (1) During unmanned phases, the ground uses the S194 DCS command so that power is continuously applied to the 2-watt Xmtr A instead of the 10-watt Xmtr A.	b) IIIb	
			FIRST FAILURE				
	M	a) Pole B of one of these relays fails open in the latch position.	a) None - Redundancy is provided by Pole B of the other relay.	a) None	a) None	a) N/A	------
		b) Contamination	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
			SECOND FAILURE				
Relays, Latching, "DCS Exp 2 Dump Relay #2" (K3-291) (52-79703-45) and "DCS Exp 2 Dump Relay #3" (K3-290) (52-79703-53) (Continued)	M	a) Pole B of the other relay fails open in the latch position.	a) (1) When the Exp 2/Data 2 Dump Enable OFF command (12-2) is given, power is not removed from Xmtr A. If ground has commanded R/T TM ON, power is applied to Xmtr B even though data is not being transmitted on Xmtr B. (2) When the crew switches "EXP 1" and/or "EXP 2" record switches to the "OFF" position and the ground commands Exp 1 & Exp Voice Dump Enable OFF (10-2) and/or Exp 2/Data 2 Dump Enable OFF (12-2), power is not removed from the Exp Rcdr Conv and the Exp 2 Rcdr.	a) When the end-of-tape is reached, the Exp 2 Rcdr "STOP" light (on Panel 204) comes ON.	a) (1) Carrier wave is received from the Xmtr which is powered-up but not transmitting data. (2) The Exp Rcdr Bus voltage monitor channels (normally M520, M521 & M522) indicate the Exp Rcdr Conv is powered-up. (3) If the end-of-tape has not been reached, the Exp 2 Rcdr tape motion monitor channel (normally K510) indicates there is tape motion. (4) The appropriate DCS verification channels indicate the commands have been correctly received & decoded by the DCS.	a) N/A	------
		b) Contamination	b) Power cannot be removed from the Exp Rcdr Conv except by opening its circuit breaker. Power can be removed from the Exp 2 Rcdr and the unused Xmtr.	b) (1) Crew informs ground of the observed anomaly. (2) Crew manually removes power from the Exp 2 Rcdr. (3) In preparation for storage, the crew must manually configure the desired Rcdr as the Data Rcdr.	b) (1) Ground requests that the crew open the circuit breaker for Xmtr A. Ground uses the S454 DCS command so that R/T TM is transmitted via Xmtr B. When Xmtr A is needed, ground must request that the crew close the circuit breaker. (2) Alternately, the ground requests that the crew manually control the transmission of recorded data and R/T TM.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
			FIRST FAILURE				
Relays, Latching, "DCS Data Dump Relay #2" (K3-110) (52-79703-53) 3.2.49	L M S	a) Pole B of one of these relays fails open in the reset position.	a) None - Redundancy is provided by Pole B of the other relay.	a) None	a) None	a) N/A	------
		b) Contamination	b) None	b) None	b) None	b) IIIb	
and			SECOND FAILURE				
"DCS Data Dump Relay #3" (K3-289) (52-79703-61) 3.2.48	L M S	a) Pole B of the other relay fails open in the reset position.	a) (1) When the ground gives the Data Dump Enable ON command (6-1) power is not supplied to the PCM Bus Conv, the Data Rcdr and the TM Xmtr for transmitting the Data Rcdr data. (2) Note - There are other commands which may have already powered-up the PCM Bus Conv, however, the Rcdr and Xmtr do not receive power.	a) None	a) (1) Carrier wave is not received from the TM Xmtr for transmitting the Data Rcdr data. (2) If R/T TM is ON, the Data Rcdr Tape Motion monitor channel indicates there is no tape motion. (3) The appropriate DCS verification channel indicates the dump command has been correctly received and decoded by the DCS.	a) N/A	------
		b) Contamination	b) None. Crew or ground can still dump the Data Rcdr.	b) None	b) (1) Ground uses the Data & Voice Dump Enable ON command (16-2) to obtain data from the Data Rcdr, or (2) Ground requests that the crew manually dump the Data Rcdr.	b) IIIb	
			FIRST FAILURE				
	L M S	a) Pole B of one of these relays fails open in the latch position.	a) None - Redundancy is provided by Pole B of the other relay.	a) None	a) None	a) N/A	------
		b) Contamination	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
			SECOND FAILURE				
Relays, Latching, "DCS Data Dump Relay #2" (K3-110) (52-79703-53) and "DCS Data Dump Relay #3" (K3-289) (52-79703-61)	L M S	a) Pole B of the other relay fails open in the latch position.	a) When ground gives the Data Dump Enable OFF command (6-1), Relays K3-289 and K3-110 do not reset. Power is not removed from the PCM Bus Conv, the Data Rcdr or TM Xmtr C.	a) None	a) (1) Carrier wave and Data Rcdr data continue to be received. (2) R/T TM indicates that the Data Rcdr has tape motion provided end-of-tape has not been reached. (3) Appropriate DCS verification channel indicates command has been correctly received and decoded by the DCS.	a) N/A	------
(Continued)		b) Contamination	b) (1) During manned phases, crew can remove power from the Data Rcdr and the TM Xmtr. (2) During unmanned phases, the excessive operating time accumulate on the Data Rcdr may necessitate premature replacement of the Rcdr.	b) None	b) (1) Ground requests that the crew manually control the Tape Rcdrs and TM Xmtrs. (2) If failure occurs during storage, ground may choose to use S453, S150 and S195 DCS commands so that power is continuously applied to the 2-watt TM Xmtr instead of one of the 10-watt Xmtrs.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
			FIRST FAILURE				
Relays, Latching, "DCS R/T TM Relay #2" (K3-106) (52-79703-45) 3.2.55	L M S	a) Pole B of one of these relays fails open in the reset position.	a) None - Redundancy is provided by Pole B of the other two relays.	a) None	a) None	a) N/A	------
		b) Contamination	b) None	b) None	b) None	b) IIIb	
and							
			SECOND FAILURE				
"DCS R/T TM Relay #3" (K3-293) (52-79703-53) 3.2.54	L M S	a) Pole B of one of the other relays fails open in the reset position.	a) None - Redundancy is provided by Pole B of the third relay.	a) None	a) None	a) N/A	------
and							
		b) Contamination	b) None	b) None	b) None	b) IIIb	
			FIRST FAILURE				
"DCS R/T TM Relay #4" (K3-292) (52-79703-61) 3.2.53	L M S	a) Pole B of one of these relays fails open in the latch position.	a) None - Redundancy is provided by Pole B of the other two relays.	a) None	a) None	a) N/A	------
		b) Contamination	b) None	b) None	b) None	b) IIIb	
			SECOND FAILURE				
	L M S	a) Pole B of one of the other relays fails open in the latch position.	a) None - Redundancy is provided by Pole B of the third relay.	a) None	a) None	a) N/A	------
		b) Contamination	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
				FIRST FAILURE			
Relay Latching, "DCS Data & Voice Dump Relay #2" (K3-104) (52-79703-53) 3.2.59	M	a) Pole B of one of these relays fails open in the reset position.	a) None - Redundancy is provided by Pole B of the other two relays.	a) None	a) None	a) N/A	---
		b) Contamination	b) None	b) None	b) None	b) IIIb	
				SECOND FAILURE			
and "DCS Data & Voice Dump Relay #3" (K3-297) (52-79703-53) 3.2.58	M	a) Pole B of one of the other relays fails open in the reset position.	a) None - Redundancy is provided by Pole B of the third relay.	a) None	a) None	a) N/A	---
		b) Contamination	b) None	b) None	b) None	b) IIIb	
				FIRST FAILURE			
and "DCS Data & Voice Dump Relay #4" (K3-296) (52-79703-61) 3.2.57	M	a) Pole B of one of these relays fails open in the latch position.	a) None - Redundancy is provided by Pole B of the other two relays.	a) None	a) None	a) N/A	---
		b) Contamination	b) None	b) None	b) None	b) IIIb	
				SECOND FAILURE			
	M	a) Pole B of one of the other relays fails open in the latch position.	a) None - Redundancy is provided by Pole B of the third relay.	a) None	a) None	a) N/A	---
		b) Contamination	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
				FIRST FAILURE			
Relays, Latching, "DCS Exp 1 & Exp Voice Dump Relay #2" (K3-101) (52-79703-53) 3.2.63	M	a) Pole B of one of these relays fails open in the reset position.	a) None - Redundancy is provided by Pole B of the other two relays.	a) None	a) None	a) N/A	---
		b) Contamination	b) None	b) None	b) None	b) IIIb	
				SECOND FAILURE			
and "DCS Exp 1 & Exp Voice Dump Relay #3" (3-295) (52-79793-53) 3.2.62	M	a) Pole B of one of the other relays fails open in the reset position.	a) None - Redundancy is provided by Pole B of the third relay.	a) None	a) None	a) N/A	---
		b) Contamination	b) None	b) None	b) None	b) IIIb	
				FIRST FAILURE			
and "DCS Exp 1 & Exp Voice Dump Relay #4" (K3-294) (52-79703-61) 3.2.61	M	a) Pole B of one of these relays fails open in the latch position.	a) None - Redundancy is provided by Pole B of the other two relays.	a) None	a) None	a) N/A	---
		b) Contamination	b) None	b) None	b) None	b) IIIb	
				SECOND FAILURE			
	M	a) Pole B of one of the other relays fails open in the latch position.	a) None - Redundancy is provided by Pole B of the third relay.	a) None	a) None	a) N/A	---
		b) Contamination	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relays, Latching, "DCS Exp 1, Exp Voice & Data Dump Relay #2" (K3-255) (52-79703-53) 3.2.66 and DCS Exp 1, Exp Voice & Data Dump Relay #3" (K3-298) (52-79703-61) 3.2.65	M		FIRST FAILURE				
		a) Pole B of one of these relays fails open in the reset position.	a) None - Redundancy is provided by Pole B of the other relay.	a) None	a) None	a) N/A	---
		b) Contamination	b) None	b) None	b) None	b) IIIb	
			SECOND FAILURE				
	M	a) Pole B of the other relay fails open in the reset position.	a) When the ground gives the Data Dump Enable ON (6-1) and Exp 1 and Exp Voice Dump Enable ON (10-2) commands, power is not supplied to TM Xmtr (normally Xmtr A) for transmitting the Data Rcdr data.	a) None	a) Ground does not receive the carrier wave from the Data Rcdr Xmtr (normally Xmtr A).	a) N/A	---
		b) Contamination	b) None. Data, Exp 1 and Exp Voice can still be transmitted by the crew or the ground.	b) None	b)(1) The ground does not attempt to transmit Data and Exp 1 and Exp Voice simultaneously, or (2) Ground requests that the crew manually control the simultaneous transmission of Data, Exp 1 and Exp Voice.	b) IIIb	
	M	a) Pole B of one of these relays fails open in the latch position.	a) None - Redundancy is provided by Pole B of the other relay.	a) None	a) None	a) N/A	---
		b) Contamination	b) None	b) None	b) None	b) IIIb	
			SECOND FAILURE				
	M	a) Pole B of the other relay fails open in the latch position.	a)(1) When the ground gives the Data Dump Enable OFF (6-1) and the Exp 1 and Exp Voice Dump, Enable OFF (10-2) commands, Relays K3-255 and K3-298 do not cycle to the reset position. Power is not removed from the Data Xmtr (normally Xmtr A). The Data Rcdr data output (Channel A) is continuously connected to a TM Xmtr (normally Xmtr A). When ground commands R/T TM ON or Exp 2/Data 2 Dump Enable ON, data signal is	a) None	a)(1) Ground continues to receive a carrier wave from the affected Xmtr (normally Xmtr A). (2) When the Data Dump Enable ON and Data Dump Execute DUMP commands are given, ground receives Data from two Xmtrs. Data signal strength is reduced. (3) Ground does not receive R/T TM or Exp 2 Rcdr data.	a) N/A	---

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relays, Latching, "DCS Exp 1, Exp Voice & Data Dump Relay #2" (K3-255) (52-79703-53) and "DCS Exp 1, Exp Voice and Data Dump Relay #3" (K3-298) (52-79703-61) (Continued)	M	b) Contamination	a)(1) not supplied to TM Xmtr. b) Crew must manually control the transmission of data. During storage, one TM Xmtr will be continuously powered-up.	b) None	b)(1) Ground requests that the crew manually transmit desired data. (2) Ground uses Backup R/T TM ON command (S268) to obtain R/T TM data. (3) During storage, ground performs required switching so that the 2-watt Xmtr is the one with the continuous application of power.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relays, Latching, "Hardline TM Transmitter Lock-out Relay #1" (K3-91) (52-79703-43) 3.2.80 and "Hardline TM Transmitter Lock-out Relay #2" (K3-92) (52-79703-43) 3.2.81			FIRST FAILURE				
	L M S	a) Poles D and C of both relays considered - one of the poles fails open in the reset position.	a) None - Due to three other redundant contacts.	a) None	a) None	a) N/A	---
		b) Contamination	b) None	b) None	b) None	b) IIIb	
			SECOND FAILURE				
	L M S	a) Poles D and C of both relays considered - one of the remaining good contact sets fails open in the reset position.	a) None - Due to two other redundant contacts.	a) None	a) None	a) N/A	---
		b) Contamination	b) None	b) None	b) None	b) IIIb	
			FIRST FAILURE				
	L M S	a) Pole B of one of these relays fails open in the reset position.	a) None - Pole B of the other relay provides redundancy.	a) None	a) None	a) N/A	---
		b) Contamination	b) None	b) None	b) None	b) IIIb	
			SECOND FAILURE				
	L M S	a) Pole B of the other relay fails open in the reset position.	a) There is a loss of power to TM Xmtr B.	a) None	a) Loss of carrier wave from Xmtr B.	a) N/A	---
		b) Contamination	b) There is a degradation of data coverage since only two frequencies will be available for data transmission.	b) None	b)(1) When data transmission from three Xmtrs is desired the ground requests that the crew manually transmit the data. (2) Ground uses necessary DCS commands for transmitting data on Xmtrs A and C.	b) IIIb	
			FIRST FAILURE				
	L M S	a) Pole A of one of these relays fails open in the reset position.	a) None - Pole A of the other relay provides redundancy.	a) None	a) None	a) N/A	---

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relays, Latching, "Hardline TM Transmitter Lock-out Relay #1" (K3-91) (52-79703-43) 3.2.80 and "Hardline TM Transmitter Lock-out Relay #2" (K3-92) (52-79703-43) 3.2.81 (Continued)	L M S	b) Contamination	b) None	b) None	b) None	b) IIIb	
			SECOND FAILURE				
	L M S	a) Pole A of the other relay fails open in the reset position.	a) There is a loss of power to TM Xmtr C.	a) None	a) None	a) N/A	---
		b) Contamination	b) There is a degradation of data coverage since only two frequencies will be available for data transmission.	b) None	b)(1) When data transmission from Xmtr C is desired, the crew requests that the ground manually transmit the data. (2) Ground uplink necessary DCS commands for transmitting data to Xmtrs A and B.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relays, Latching, "Recorder Control Mode Relay #2/#3/#4/#5/#6/#7" (K3-319) (K3-320) (K3-321) (K3-322) (K3-323) (K3-324) (52-79703-61) (3.4.10 thru 3.4.15)			FIRST FAILURE				
	M	a) Pole B of one of these relays fails open in the reset position.	a) None - Redundancy is provided by Pole B of the remaining five relays.	a) None	a) None	a) N/A	—
		b) Contamination	b) None	b) None	b) None	b) IIIb	
			SECOND FAILURE				
	M	a) Pole B of one of the other relays fails open in the reset position.	a) None - Redundancy is provided by Pole B of the remaining four relays.	a) None	a) None	a) N/A	—
		b) Contamination	b) None	b) None	b) None	b) IIIb	
			FIRST FAILURE				
	M	a) Pole B of one of these relays fails open in the latch position.	a) None - Redundancy is provided by Pole B of the remaining five relays.	a) None	a) None	a) N/A	—
		b) Contamination	b) None	b) None	b) None	b) IIIb	
			SECOND FAILURE				
	M	a) Pole B of one of the other relays fails open in the latch position.	a) None - Redundancy is provided by Pole B of the remaining four relays.	a) None	a) None	a) N/A	—
		b) Contamination	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
			FIRST FAILURE				
Relay, Latching, "Exp 1 Recorder Motion Monitor Relay #1" (K3-285) (52-79703-45) 3.4.20 or Relay, Slow Release, "Exp 1 Recorder Motion Monitor Relay #2" (K3-286) (52-79715-13) 3.4.21 and Relays, Latching, "AM Exp 1 Record Relays #1 and #2" (K3-268 and K3-269) (52-79703-53) 3.7.15 and 3.7.16 or Relays, Latching "OWS Exp 1 Record Relays #1 and 2" (K3-264 and K3-265) (52-79703-53) 3.7.17 and 3.7.18	M	a)(1) Pole B (K3-285) fails open in the latch position, or (2) Reset coil (K3-285) fails open, or (3) Pole A (K3-286) fails open when the coil is energized, or (4) Coil (K3-286) fails open when Relay K3-285 is in the latch position.	a) None	a) None	a) None	a) N/A	—
		b)(1) Contamination (2) Defective wire or terminal due to mechanical or thermal stress.	b) None	b) None	b) None	b) [illegible]	
			SECOND FAILURE				
	M	a) Reset coil of K3-286 or -269 or -264 or -265 fails open when Relay is in the latch position.	a) Power is not removed from the AM and OWS Exp 1 "RECORD" indicator lights when the Exp 1 switch(es) are switched to the "OFF" position. Also, power is not removed from the PCM Bus Conv and the Exp Rcdr Conv.	a)(1) The Exp 1 "RECORD" indicator lights do not turn off when the Exp 1 switches are switched to the "OFF" position. (2) If end-of-tape reached, the Exp 1 Rcdr "STOP" light comes ON.	a) R/T TM indicates the Exp 1 Rcdr has tape motion and that the Exp Rcdr Conv is powered up.	a) N/A	—
		b) Defective wire or terminal due to mechanical or thermal stress.	b) Power cannot be removed from the PCM Bus Conv and the Exp Rcdr Conv, except by opening the circuit breakers. This results in excessive power consumption. The crew can remove power from the Exp 1 Rcdr by manually controlling the Rcdr data assignments.	b) (1) Crew checks the switches and circuit breakers of associated equipment which could cause the anomaly. (2) Crew informs ground of the anomaly.	b)(1) Ground requests that the crew manually control the Rcdr data assignments so that power can be removed from the Exp 1 Rcdr. (2) Ground requests that the crew open the Exp Rcdr Conv circuit breaker when the Exp Rcdrs are not being used.	b) [illegible]	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Exp 2 Recorder Motion Monitor Relay #1" (K3-287) (52-79703-45) 3.4.22 or Relay, Slow Release, "Exp 2 Recorder Motion Monitor Relay #2" (K3-288) (52-79715-13) 3.4.23 and Relays, Latching, "AM Exp 2 Record Relays #1 & #2" (K3-270 & K3-271) (52-79703-53) 3.7.13 & 3.7.14 or Relays, Latching "OWS Exp 2 Record Relays #1 & #2" (K3-266 and K3-267) (52-79703-53) (3.7.19 & 3.7.20	M	a) (1) Pole B (K3-287) fails open in the latch position, or (2) Reset coil (K3-287) fails open, or (3) Pole A (K3-288) fails open when the coil is energized, or (4) Coil (K3-288) fails open when Relay K3-287 is in the latch position.	FIRST FAILURE a) None	a) None	a) None	a) N/A	—
		b) (1) Contamination (2) Defective wire or terminal due to mechanical or thermal stress.	b) None	b) None	b) None	b) IIIB	
			SECOND FAILURE				
	M	a) Reset coil of K3-270 or -271 or -266 or -267 fails open when Relay is in the latch position.	a) Power is not removed from the AM and OWS Exp 2 "RECORD" indicator lights when the Exp 2 switch(es) are switched to the "OFF" position. Also, power is not removed from the PCM Bus Conv and the Exp Rcdr Conv.	a)(1) The Exp 2 "RECORD" indicator lights do not turn off when the Exp 2 switches are switched to the "OFF" position. (2) If the end-of-tape is reached, the Exp 2 Rcdr "STOP" light comes ON.	a) R/T TM indicates the Exp Rcdr has tape motion and that the Exp Rcdr Conv is powered up.	a) N/A	—
		b) Defective wire or terminal due to mechanical or thermal stress.	b) Power cannot be removed from the PCM Bus Conv. and the Exp. Rcdr Conv except by opening their circuit breakers. This results in excessive power consumption. The crew can remove power from the Exp 2 Rcdr by manually controlling the Rcdr data assignments.	b)(1) Crew checks the switches and circuit breakers of associated equipment, which could cause the anomaly. (2) Crew informs ground of the anomaly.	b)(1) Ground requests that the crew manually control the Rcdr data assignments, so that power can be removed from the Exp 2 Rcdr. (2) Ground requests that the crew open the Exp Rcdr Conv circuit breaker when the Exp Rcdrs are not being used.	b) IIIB	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
			FIRST FAILURE				
Relays, Latching, "EKG/ZPN Relay #1" (K3-373) (52-79703-61) 3.4.52 and	M	a) Pole B of one relay fails open in the latch position.	a) None - Redundancy on Pole B of the other relay.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) None	
			SECOND FAILURE				
"EKG/ZPN Relay #2" (K3-374) (52-79703-61) 3.4.53	M	a) Pole B of the other relay fails open in the latch position.	a) When the "EKG/ZPN" switch is switched to the "OFF" position Relays K3-373 and K3-374 do not cycle to the reset position. There is a loss of the Vectorcardiogram No. 1 (N301), Korotkoff Sound Signal (N304) inputs to the Interface Box for Subframe 2 and a loss of M-509/T013 Data and Clock inputs to the Exp 1 Rcdr. Note - N304 has been deleted but is shown on the 61J760026 drawing.	a) None	a) (1) Ground observes a loss of Vectorcardiogram No. 1 (N301 and the Korotkoff Sound Signal (N304) from Subframe 2 data (R/T and delayed time). In their locations are the Electrocardiogram, Channel A (M405) and the Impedance Pneumograph, Channel A, parameters respectively. (2) Ground observes a loss of M 509/T 013 Experiment Data.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) Loss of the N301, N304 parameters and M 509/T-013 Experiment data.	b) None	b) Ground informs crew of the anomaly.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
			FIRST FAILURE				
Relays, Latching, "EKG/ZPN Relay #1" (K3-373) (52-79703-61) and "EKG/ZPN RElay #2" (K3-374) (52-79703-61)	M	a) Pole B of one relay fails open in the reset position.	a) None - Redundancy on Pole B of the other relay.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
			SECOND FAILURE				
(Continued)	M	a) Pole B of the other relay fails open in the reset position.	a) When the "EKG/ZPN" switch is switched to the "ENABLE" position, Relays K3-373 and K3-374 do not cycle to the latch position. This results in a loss of Impedance Pneumograph, Channel A (M403) and Electrocardiogram, Channel A (M405) inputs to the Interface Box for Subframe 2 (R/T and delayed time).	a) None	a) Ground observes a loss of Impedance Pneumograph, Channel A (M403) and Electrocardiogram, Channel A (M405) from Subframe 2 data (R/T and delayed time).	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) The M403 and M405 parameters are only available in R/T via the Master Frame.	b) None	b) Ground requests that the crew switch the "EKG/ZPN" switch to the "OFF" position. This puts the M403 thru M406 parameters in the Master Frame (R/T) instead of Subframes 2 and 3.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
			FIRST FAILURE				
Relays, Latching, "EKG/ZPN Relay #4" (K3-376) (52-79703-61) 3.4.56 and "EKG/ZPN Relay #5" (K3-377) (52-79703-61) 3.4.57	M	a) Pole B of one relay fails open in the reset position.	a) None - Redundancy on Pole B of the other relay.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
			SECOND FAILURE				
	M	a) Pole B of the other relay fails open in the reset position.	a) When the "EKG/ZPN" switch is cycled to the "ENABLE" position, Relays K3-376 and K3-377 do not latch. The Impedance Pneumograph, Channel B (M404) and Electrocardiogram, Channel B (M406) inputs to the IB cannot be switched from the Master Frame to Subframe 3 for recording data. Power is not removed from the OWS Exp 1 and Exp 2 "RECORD" indicator lights.	a) When the crew switches the "EKG/ZPN" switch to the "ENABLE" position, the OWS Exp 1 and/or Exp 2 "RECORD" indicator lights do not extinguish as expected.	a) Ground observes the Impedance Pneumograph, Channel B (M404) and the Electrocardiogram, Channel B (M406) parameters are in the Master Frame rather than in Subframe 3.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) The M404 and M406 parameters cannot be recorded. They are available only as R/T data.	b) Crew informs the ground of the anomaly.	b) Ground informs crew of the anomaly.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
			FIRST FAILURE				
Relays, Latching "EKG/ZPN Relay #4" (K3-376) (52-79703-61)	M	a) Pole B of one of these relays fails open in the latch position	a) None - Redundancy on Pole B of the other relay.	a) None	a) None	a) N/A	---
and "EKG/ZPN Relay #5" (K3-377) (52-79703-61)		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
			SECOND FAILURE				
(Continued)	M	a) Pole B of the other relay fails open in the latch position.	a) When the "EKG/ZPN" switch is switched to the "OFF" position, Relays K3-376 and K3-377 do not reset. This results in the following effects: o Impedance Pneumograph, Channel B (M404) and Electrocardiogram, Channel B (M406) and cannot be switched from Subframe 3 to the Master Frame. o There is a loss of Vectorcardiogram No. 2 (N302), Polarizer Sync (N307), Vectorcardiogram No. 3 (N303) and Photomultiplier Current (N308) on Subframe 3. o There is a loss of power to the OWS Exp 1 and Exp 2 "RECORD" indicator lights.	a) When the crew switches an Exp 1 and/or Exp 2 switch to the "RECORD" position, the OWS Exp 1 and/or Exp 2 "RECORD" indicator lights do not come ON.	a) (1) Ground observes that M404 and M406 parameters are in Subframe 3 instead of the Master Frame. (2) Ground observes a loss of N302, N303, N307 and N308 parameters in Subframe 3.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) Loss of N302, N303, N307 and N308 data.	b) Crew informs the ground of the anomaly	b) Ground informs crew of the anomaly.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "QCM Contamination Monitor Relay" (K3-381) (52-79703-45) 3.5.32			FIRST FAILURE				
	L M S	a) Pole B or Pole C fails open in the latch position.	a) None - Redundancy provided by the other of these two poles.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
			SECOND FAILURE				
	L M S	a) The other pole fails open in the latch position.	a) Loss of power to the QCM Contamination Monitors.	a) None	a) Ground observes a loss of data from each of the four QCM's.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) Loss of data from the QCM's.	b) None	b) Ground requests that the crew check the "QCM MCM" circuit breaker on Panel 200.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relays Latching, "Data Record Mode Control Relay #1". (K3-274) 3.7.5 and "Data Record Mode Control Relay 2" (K3-275) (52-79703-61) 3.7.6	M		FIRST FAILURE				
		a) Pole B of one of these relays fails open in the reset position.	a) None	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
			SECOND FAILURE				
	M	a) Pole B of the other relay fails open in the reset position.	a) The relays do not cycle to the latch position when the crew switches the "TAPE RECORDING DATA" switch (on Panel 204) to the "OFF" or "RECORD" position.	a)(1) If "DATA" switch has been switched to the "RECORD" position, the "DATA RECORD" light (on Panel 204) does not come ON.	a) When switch is placed in the "RECORD" position, R/T TM indicates Data Rcdr has no tape motion.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b)(1) None. When crew replaces a Rcdr, they also use the "TAPE RECORDERS" switches (on Panel 204) to make certain that power is removed from the Rcdr being replaced. (2) The ground normally controls the recording of Data (subframe 1). Crew can record Data (subframe 1) by using the Voice Record switches.	b)(1) Crew switches the "STATUS LIGHTS" switch to the "TEST" position. The "RECORD" lights test good. (2) The ground normally controls the recording of Data (subframe 1). Crew can record Data (subframe 1) by using the Voice Record switches.	b)(1) Ground verifies that the Data Rcdr has no tape motion with "DATA" switch in the "RECORD" position.	b) IIIb	
			FIRST FAILURE				
	M	a) Pole B of one of the relays fails open in the latch position.	a) None	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
			SECOND FAILURE				
	M	a) Pole B of the other relay fails open in the latch position.	a) The relays do not cycle to the reset position when the crew switches the "TAPE RECORDING DATA" switch to the "CMD" position.	a) None	a)(1) When ground gives the Tape Recording - Data RECORD command (S376), R/T TM indicates the Data Rcdr has no tape motion.	a) N/A	---

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relays, Latching "Data Record Mode Control Relay #1" (K3-274) (52-79703-61) and "Data Record Mode Control Relay #2" (K3-275) (52-79703-61) (Continued)		a)(continued)			a)(2) Recorded Data (subframe 1) is not received for those time periods in which the ground gave the Data record command. (3) Ground observes a loss of recorded Data 2 (subframe 4).	a) N/A	---
		b) Insulating film on contacts due to contamination.	b)(1) There is a loss of recorded Data 2 (subframe 4) during storage periods. (2) Crew can control Data Rcdr during manned phases. (3) Ground can also perform switching to record Data (subframe 1).	b) None	b)(1) Ground can get necessary power to the Data Recdr for recording Data (subframe 1) by using the Back-up R/T TM ON command (S268) (2) Ground requests that the crew manually control the recording of Data (subframe 1).	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relays, Latching "Data 2 Control Relay #1" (K3-314) (52-79703-61) 3.7.8 and "Data 2 Control Relay #2" (K3-315) (52-79703-61) 3.7.9			FIRST FAILURE				
	L M S	a) Pole B of one of the relays fails open in the reset position.	a) None	a) None	a) None	a) N/A	---
		b)(1) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
			SECOND FAILURE				
	L M S	a) Pole B of the other relay fails open in the reset position.	a) The relays do not cycle to the latch position when the ground gives the Tape Recording - Data 2 RECORD command (S330).	a) None	a)(1) When the Data 2 RECORD command is given, the Exp 2 Rcdr tape motion monitor indicates there is no tape motion. (2) There is a loss of recorded Data 2.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) There is a loss of recorded Data 2 (subframe 4).	b) None	b) None.	b) IIIb	
			FIRST FAILURE				
	L M S	a) Pole B of one relay fails open in the latch position.	a) None	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
			SECOND FAILURE				
	L M S	a) Pole B of the other relay fails open in the latch position.	a) The relays do not cycle to the latch position when the Tape Recording - Data 2 OFF command (S331) is given or the crew switches the "DATA" switch to the "OFF" position or one of the Exp 2 switches is switched to the "RECORD" position. Power is not removed from the following equipment:	a) None	a)(1) When Data 2 OFF command (S331) is given, T/M indicates that the Exp 2 Rcdr has tape motion and that the Exp Rcdr Bus is still powered-up. (2) The temperature of the Converters may be higher than expected when they are supposed to have been powered-down.	a) N/A	---

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relays, Latching "Data 2 Control Relay #1" (K3-314) (52-79703-61) and "Data 2 Control Relay #2" (K3-315) (52-79703-61) (Continued)		a) (continued)	o PCM Bus Conv and Exp Rcdr Conv. o PCM Pgmr, I/B, H.L. Multiplexers & L. L. Multiplexers. o Exp 2 Tape Rcdr o Group 1 and Group 2 Transducers o AM Signal Conditioners o MDA, OWS-1 and OWS-2 Signal Conditioners		a)(3) Loss of Exp 2 data if ground was recording Data 2 when an Exp 2 switch was switched to the "RECORD" position.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b)(1) Excessive power consumption. Power to the Exp 2 Rcdr can be removed by the crew. Power to the Converters can only be removed by opening their circuit breakers. (2)If failure occurs during storage, excessive hours of operation on the Exp 2 Rcdr may necessitate revision of Rcdr resupply plans.	b) None	b)(1) Ground gives the Data 2 OFF command (S331) so that the crew can record Exp 2 data.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
				FIRST FAILURE			
Switch, Momentary, "TAPE RECORDING EXP 1" (52-79705-113) 3.7.11	M	a) Contact set 2,3 (or 5,6) fails open in the "RECORD" position.	a) None	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
				SECOND FAILURE			
This switch is located on Panel 204 and is used for recording EXP 2 data (sub-frame 3) from the Airlock Module	M	a) Contact set 5,6 (or 2,3) fails open in the "RECORD" position.	a) There is a loss of capability to record EXP 1 data (sub-frame 2) from the AM.	a) The AM and OWS EXP 1 "RECORD" lights do not come ON when the AM "EXP 1" switch is switched to the "RECORD" position.	a) (1) The EXP 1 Rcdr tape motion monitor channel (normally K509) indicates there is no tape motion. (2) The EXP rcdr Bus voltage monitor channels (normally M520, M521 & M522) indicates that the EXP Rcdr Conv is Not powered-up.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. Recording of EXP 1 data can be controlled with the OWS EXP 1 switch.	b) (1) Crew switches the OWS EXP 1 switch to the "RECORD" position. The AM and OWS EXP 1 "RECORD" lights come ON. (2) Crew informs ground of the anomaly.	b) (1) Ground verifies that the EXP 1 Rcdr did not start recording data when the AM EXP 1 switch was switched to the "RECORD" position.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
				FIRST FAILURE			
Switch, Momentary, "TAPE RECORDING EXP 2" (52-79705-113) 3.7.12	M	a) Contact set 2,3 (or 5,6) fails open in the "RECORD" position.	a) None	a) None	a) None.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
				SECOND FAILURE			
This switch is located on Panel 204 and is used for recording EXP 2 data (subframe 3) from the Airlock Module.	M	a) Contact set 5,6 (or 2,3) fails open in the "RECORD" position.	a) There is a loss of capability to record EXP 2 data (subframe 3) from the AM.	a) The AM and OWS EXP 2 "RECORD" lights do not come ON when the AM "EXP 2" switch is switched to the "RECORD" position.	a) (1) The EXP 2 Rcdr tape motion monitor channel (normally K510) indicates there is no tape motion. (2) The EXP Rcdr Bus voltage monitor channels (normally M520, M521 & M522) indicates that the EXP Rcdr Conv is not powered up.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. Recording of EXP 2 data can be controlled with the OWS EXP 2 switch.	b) (1) Crew switches the OWS EXP 2 switch to the "RECORD" position. The AM and OWS EXP 2 "RECORD" lights come ON. (2) Crew informs ground of the anomaly.	b) (1) Ground verifies that the EXP 2 Rcdr did not start recording data when the AM EXP 2 switch was switched to the "RECORD" position.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
			FIRST FAILURE				
Relays, Latching, "AM Exp 2 Record Relay #1" (K3-270) (52-79703-53) 3.7.13 and "AM Exp 2 Record Relay #2" (K3-271) (52-79703-53) 3.7.14	M	a) Pole F of Relay K3-271 fails open in the latch position.	a) None	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
			SECOND FAILURE				
	M	a) Pole F of Relay K3-270 fails open in the latch position.	a) When the crew switches the AM "Exp 2" switch (on Panel 204) to the "RECORD" position, power is not supplied to the Exp 2 Rcdr.	a) The AM & OWS Exp 2 "RECORD" lights do not come ON.	a) The Exp 2 Rcdr tape motion monitor channel (normally K510 indicates there is no tape motion.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. Crew can use the OWS Exp 2 switch to record Exp 2 data.	b)(1) Crew switches the "LIGHTING STATUS" switch to the "TEST" position. The AM Exp 2 "RECORD" light tests good. (2) Crew switches the OWS Exp 2 switch to the "RECORD" position. The Exp 2 "RECORD" lights come on.	b)(1) Ground informs crew that the Exp 2 Rcdr has no tape motion. (2) Ground requests that the crew switch the OWS Exp 2 switch to the "RECORD" position.	b) IIIb	
			FIRST FAILURE				
	M	a) Pole E of one of the relays fails open in the latch position.	a) None.	a) None.	a) None.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None.	b) None.	b) IIIb	
			SECOND FAILURE				
	M	a) Pole E of the other relay fails open in the latch position.	a) If ground has given the Data 2 RECORD command (S330), there is a loss of recorded Exp 2 data if the crew switches the AM Exp 2 switch (on Panel 204) to the "RECORD" position.	a) None.	a) Through communications with crew or Recorded Voice, ground may learn that Exp 2 data was being recorded at a certain time. When Exp 2 Rcdr is dumped, recorded Data 2 is received for that time period rather than recorded Exp 2 data.	a) N/A	---

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relays, Latching, "AM Exp 2 Record Relay #1" (K3-270) (52-79703-53) and "AM Exp 2 Record Relay #2" (K3-271) (52-79703-53)	M	b) Insulating film on contacts due to contamination.	b) Loss of some recorded Exp 2 data. Crew or ground can restore Exp 2 recording capability.	b) None	b)(1) Ground requests that the crew use the OWS Exp 2 switch for recording Exp 2 data, or (2) Ground gives Data 2 OFF command, which permits recording from the AM Exp 2 switch.	b) IIIb	
			FIRST FAILURE				
(Continued)	M	a) Pole D of one of the relays fails open in the latch position.	a) None	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
			SECOND FAILURE				
	M	a) Pole D of the other relay fails open in the latch position.	a) When the crew switches the AM "Exp 2" switch (located on Panel 204) to the "RECORD" position, power is not applied to the Exp Rcdr Conv. This results in a loss of power for the Exp 2 Rcdr.	a) The AM and OWS Exp 2 "RECORD" lights do not come ON.	a)(1) The Exp 2 Rcdr tape motion monitor channel (normally K510) indicates no tape motion. (2) The Exp Rcdr Bus voltage monitors (normally M520, M521 and M522) indicate zero volts. (3) Loss of recorded Exp 2 data.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) Loss of some recorded Exp 2 data. Crew or ground can restore Exp 2 recording capability.	b)(1) Crew switches the "LIGHTING STATUS" switch to the "TEST" position. The AM Exp 2 "RECORD" light tests good. (2) Crew switches the OWS Exp 2 switch to the "RECORD" position. The Exp 2 "RECORD" lights come ON.	b)(1) Ground requests that the crew use the OWS Exp 2 switch for recording Exp 2 data.	b) IIIb	
			FIRST FAILURE				
	M	a) Pole C of one of the relays fails open in the latch position.	a) None	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relays, Latching, "AM Exp 2 Record Relay #1" (K3-270) (52-79703-53) and "AM Exp 2 Record Relay #2" (K3-271) (52-79703-53) (Continued)	M		SECOND FAILURE				
		a) Pole C of the other relay fails open in the latch position.	a) When the crew switches the AM "Exp 2" switch (located on Panel 204) to the "RECORD" position, power is not applied to the PCM Bus Conv. This results in a loss of power to the PCM Sys.	a) None	a) Loss of recorded Exp 2 data.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) Loss of some recorded Exp 2 data. Crew or ground can restore Exp 2 recording capability.	b) None	b)(1) Ground requests that the crew use the OWS Exp 2 switch for recording Exp 2 data.	b) IIIb	
			FIRST FAILURE				
	M	a) Pole B of one of the relays fails open in the latch position.	a) None	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
			SECOND FAILURE				
	M	a) Pole B of the other relay fails open in the latch position.	a) When the crew switches the AM "Exp 2" switch (located on Panel 204) to the "RECORD" position, power is not supplied to the Exp 2 "RECORD" lights.	a) The AM and OWS Exp 2 "RECORD" lights do not come ON.	a)(1) The Exp 2 Rcdr tape motion monitor channel (normally K510) indicates there is tape motion.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b)(1) Crew switches the "LIGHTING STATUS" switch (on Panel 207) to the "TEST" position. The AM Exp 2 "RECORD" light tests good. (2) Crew switches the OWS Exp 2 switch to the "RECORD" position. The Exp 2 "RECORD" lights come on.	b) None	b) IIIb	
			FIRST FAILURE				
	M	a) Latch coil of one of the relays fails open.	a) None	a) None	a) None	a) N/A	---

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relays, Latching, "AM Exp 2 Record Relay #1" (K3-270) (52-79703-53) and "AM Exp 2 Record Relay #2" (K3-271) (52-79703-53) (Continued)	M	b) Defective wire or terminal due to mechanical or thermal stress.	b) None	b) None	b) None	b) IIIb	
			SECOND FAILURE				
	M	a) Latch coil of the other relay fails open.	a) When the crew switches the AM "Exp 2" switch (located on Panel 204) to the "RECORD" position, power is not supplied to the PCM Bus Conv and the Exp Rcdr Conv.	a) The AM and OWS Exp 2 "RECORD" lights do not come ON.	a)(1) Loss of recorded Exp 2 data.	a) N/A	---
		b) Defective wire or terminal due to mechanical or thermal stress.	b) Loss of some recorded Exp 2 data.	b)(1) Crew switches the "LIGHTING STATUS" switch (on Panel 207) to the "TEST" position. The AM Exp 2 "RECORD" light "TESTS" good. (2) Crew switches the OWS Exp 2 switch to the "RECORD" position. The Exp 2 "RECORD" lights come ON.	b)(1) Ground requests that the crew use the OWS Exp 2 switch to record Exp 2 data.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relays, Latching, "AM Exp 1 Record Relay #1" (K3-268) (52-79703-53) 3.7.15 and "AM Exp 1 Record Relay #2" (K3-269) (52-79703-53) 3.7.16	M		FIRST FAILURE				
		a) Pole F of Relay K3-269 fails open in the latch position.	a) None	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
			SECOND FAILURE				
	M	a) Pole F of Relay K3-268 fails open in the latch position.	a) When the crew switches the AM "Exp 1" switch (on Panel 204) to the "RECORD" position, power is not supplied to the Exp 1 Rcdr.	a) The AM and OWS Exp 1 "RECORD" lights do not come ON.	a) The Exp 1 Rcdr tape motion monitor channel (normally K509) indicates there is no tape motion.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. Crew can use the OWS Exp 1 switch to record Exp 1 data.	b)(1) Crew switches the "LIGHTING STATUS" switch to the "TEST" position. The AM Exp 1 "RECORD" light tests good. (2) Crew switches the OWS Exp 1 switch to the "RECORD" position. The Exp 1 "RECORD" lights come ON.	b)(1) Ground informs crew that the Exp 1 Rcdr has no tape motion. (2) Ground requests that the crew switch the OWS Exp 1 switch to the "RECORD" position.	b) IIIb	
			FIRST FAILURE				
	M	a) Pole E of one of the relays fails open in the latch position.	a) None	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
			SECOND FAILURE				
	M	a) Pole E of the other relay fails open in the latch position.	a) When the crew switches the AM "Exp 1" switch (on Panel 204) to the "RECORD" position, power is not supplied to the MDA, OWS-1 and OWS-2 Signal Conditioners.	a) None	a) Ground observes a loss of MDA, OWS-1 and OWS-2 Signal Conditioner data on recorded Exp 1 data (subframe 1).	a) N/A	---

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relays, Latching, "AM Exp 1 Record Relay #1" (K3-268) (52-79703-53) and "AM Exp 1 Record Relay #2" (K3-269) (52-79703-53) (continued)	M	b) Insulating film on contacts due to contamination.	b) None. Power to the affected Signal Conditioners can be restored.	b) None	b) Ground requests that the crew use the CWS Exp 1 switch to record Exp 1 data.	b) IIIb	
			FIRST FAILURE				
	M	a) Pole D of one of the relays fails open in the latch position.	a) None	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
			SECOND FAILURE				
	M	a) Pole D of the other relay fails open in the latch position.	a) When the crew switches the AM "Exp 1" switch (located on Panel 204) to the "RECORD" position, power is not applied to the Exp Rcdr Conv. This results in a loss of power for the Exp 1 Rcdr.	a) The AM and CWS Exp 1 "RECORD" lights do not come ON.	a)(1) The Exp 1 Rcdr tape motion monitor channel (normally K509) indicates no tape motion. (2) The Exp Rcdr Bus voltage monitors (normally M520, M521 and M522) indicate zero volts. (3) Loss of recorded Exp 1 data	a) N/A	---
		b) Insulating film on contacts due contamination.	b) Loss of some recorded Exp 1 data. Crew or ground can restore Exp 1 recording capability.	b)(1) Crew switches the "LIGHTING STATUS" switch to the "TEST" position. The AM Exp 1 "RECORD" light tests good. (2) Crew switches the CWS Exp switch to the "RECORD" position. The Exp 1 "RECORD" lights come ON.	b)(i) Ground requests that the crew use the CWS Exp 1 switch for recording Exp 1 data.	b) IIIb	
			FIRST FAILURE				
	M	a) Pole C of one of the relays fails open in the latch position.	a) None	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
			SECOND FAILURE				
Relays, Latching, "AM Exp 1 Record Relay #1" (K3-268) (52-79703-53) and "AM Exp 1 Record Relay #2" (K3-269) (52-79703-53) (Continued)	M	a) Pole C of the other relay fails open in the latch position.	a) When the crew switches the AM "Exp 1" switch (located on Panel 204) to the "RECORD" position, power is not applied to the PCM Bus Conv. This results in a loss of power to the PCM Sys.	a) None	a) Loss of recorded Exp 1 data.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) Loss of some recorded Exp 1 data. Crew or ground can restore Exp 1 recording capability.	b) None	b)(1) Ground requests that the crew use the OWS Exp 1 switch for recording Exp 1 data.	b) IIIb	
			FIRST FAILURE				
	M	a) Pole B of one of the relays fails open in the latch position.	a) None	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
			SECOND FAILURE				
	M	a) Pole B of the other relay fails open in the latch position.	a) When the crew switches the AM "Exp 1" switch (located on Panel 204) to the "RECORD" position, power is not supplied to the Exp 1 "RECORD" lights.	a) The AM and OWS Exp 1 "RECORD" lights do not come ON.	a) The Exp 1 Rcdr tape motion monitor channel (normally K509) indicates there is tape motion.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b)(1) Crew switches the "LIGHTING STATUS" switch (on Panel 207) to the "TEST" position The AM Exp 1 "RECORD" light tests good. (2) Crew switches the OWS Exp 2 switch to the "RECORD" position. The Exp 1 "RECORD" lights come ON.	b) None	b) IIIb	
			FIRST FAILURE				
	M	a) Latch coil of one of the relays fails open.	a) None	a) None	a) None	a) N/A	---

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relays, Latching, "AM Exp 1 Record Relay #1" (K3-268) (52-79703-53) and "AM Exp 1 Record Relay #2" (K3-269) (52-79703-53) (Continued)	M	b) Defective wire or terminal due to mechanical or thermal stress.	b) None	b) None	b) None	b) IIIb	
			SECOND FAILURE				
	M	a) Latch coil of the other relay fails open.	a) When the crew switches the AM "Exp 1" switch (located on Panel 204) to the "RECORD" position, power is not supplied to the PCM Bus Conv and the Exp Rcdr Conv.	a) The AM and OWS Exp 1 "RECORD" lights do not come ON.	a)(1) Loss of recorded Exp 1 data	a) N/A	---
		b) Defective wire or terminal due to mechanical or thermal stress.	b) Loss of some recorded Exp 1 data.	b)(1) Crew switches the "LIGHTING STATUS" switch (on Panel 207) to the "TEST" position The AM Exp 1 "RECORD" light "TESTS" good. (2) Crew switches the OWS Exp 1 switch to the "RECORD" position. The Exp 1 "RECORD" lights come ON.	b)(1) Ground requests that the crew use the OWS Exp 1 switch to record Exp 1 data	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relays, Latching, "OWS Exp 1 Record Relay #1" (K3-264) (52-79703-53) 3.7.17 and "OWS Exp 1 Record Relay #2" (K3-265) (52-79703-53) 3.7.18			FIRST FAILURE				
	M	a) Pole F of Relay K3-265 fails open in the latch position.	a) None	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
			SECOND FAILURE				
	M	a) Pole F of Relay K3-264 fails open in the latch position.	a) When the crew switches the OWS "Exp 1" switch to the "RECORD" position, power is not supplied to the Exp 1 Rcdr.	a) The AM and OWS Exp 1 "RECORD" lights do not come ON.	a) The Exp 1 Rcdr tape motion monitor channel (normally K509) indicates there is no tape monitor.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. Crew can use the AM Exp 1 Switch to record Exp 1 data.	b) (1) Crew switches the "LIGHTING STATUS" switch to the "TEST" position. The AM Exp 1 "RECORD" light tests good. (2) Crew switches the AM Exp 1 switch to the "RECORD" position. The Exp 1 "RECORD" lights come ON.	b)(1) Ground informs crew that the Exp 1 Rcdr has no tape motion. (2) Ground requests that the crew switch the AM Exp 1 switch to the "RECORD" position.	b) IIIb	
			FIRST FAILURE				
	M	a) Pole E of one of the relays fails open in the latch position.	a) None	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
			SECOND FAILURE				
	M	a) Pole E of the other relay fails open in the latch position.	a) When the crew switches the OWS "Exp 1" switch to the "RECORD" position, power is not supplied to the MDA, OWS-1 and OWS-2 Signal Conditioners.	a) None	a) Ground observes a loss of MDA, OWS-1 and OWS-2 Signal Conditioner data on recorded Exp 1 data (subframe 1)	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. Power to the affected Signal Conditioners can be restored.	b) None	b) Ground requests that the crew use the AM Exp 1 switch to record Exp 1 data.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relays, Latching, "OWS Exp 1 Record Relay #1" (K3 264) (52-79703-53) and "OWS Exp 1 Record Relay #2" (K3-265) (52-79703-53) (Continued)	M		FIRST FAILURE				
		a) Pole D of one of the relays fails open in the latch position.	a) None	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
			SECOND FAILURE				
	M	a) Pole D of the other relay fails open in the latch position.	a) When the crew switches the OWS "Exp 1" switch to the "RECORD" position, power is not applied to the Exp Rcdr Conv. This results in a loss of power for the Exp 1 Rcdr.	a) The AM and OWS Exp 1 "RECORD" lights do not come ON.	a)(1) The Exp 1 Rcdr tape motion monitor channel (normally K509) indicates no tape motion. (2) The Exp Rcdr Bus voltage monitors (normally M520, M521 and M522) indicate zero volts. (3) Loss of recorded Exp 1 data	a) N/A	---
		b) Insulating film on contacts due to contamination	b) Loss of some recorded Exp 1 data. Crew or ground can restore Exp 1 recording capability.	b)(1) Crew switches the "LIGHTING STATUS" switch to the "TEST" position. The AM Exp 1 "RECORD" light tests good. (2) Crew switches the AM Exp 1 switch to the "RECORD" position. The Exp 1 "RECORD" lights come ON.	b)(1) Ground requests that the crew use the AM Exp 1 switch for recording Exp 1 data.	b) IIIb	
			FIRST FAILURE				
	M	a) Pole C of one of the relays fails open in the latch position.	a) None	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
			SECOND FAILURE				
	M	a) Pole C of the other relay fails open in the latch position.	a) When the crew switches the OWS "EXP 1" switch to the "RECORD" position, power is not applied to the PCM Bus Conv. This results in a loss of power to the PCM Sys.	a) None	a) Loss of recorded Exp 1 data.	a) N/A	---

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relays, Latching, "OWS Exp 1 Record Relay #1" (K3-264) (52-79703-53) and "OWS Exp 1 Record Relay #2" (K3-265) (52-79703-53) (Continued)	M	b) Insulating film on contacts due to contamination.	b) Loss of some recorded Exp 1 data. Crew or ground can restore Exp 1 recording capability.	b) None	b)(1) Ground requests that the crew use the AM Exp 1 switch for recording Exp 1 data.	b) IIIb	
			FIRST FAILURE				
	M	a) Pole B of one of the relays fails open in the latch position.	a) None	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
			SECOND FAILURE				
	M	a) Pole B of the other relay fails open in the latch position.	a) When the crew switches the OWS "Exp 1" switch to the "RECORD" position, power is not supplied to the Exp 1 "RECORD" lights.	a) The AM and OWS Exp 1 "RECORD" lights do not come ON.	a) The Exp 1 Redr tape motion monitor channel (K509) indicates there is tape motion.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b)(1) Crew switches the "LIGHTING STATUS" switch (on Panel 207) to the "TEST" position. The AM Exp 1 "RECORD" light tests good. (2) Crew switches the AM Exp 1 switch to the "RECORD" position. The Exp 1 "RECORD" lights come ON.	b) None	b) IIIb	
			FIRST FAILURE				
	M	a) Latch coil of one of the relays fails open.	a) None	a) None	a) None	a) N/A	---
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None	b) None	b) None	b) IIIb	
			SECOND FAILURE				
	M	a) Latch coil of the other relay fails open.	a) When the crew switches the OWS "Exp 1" switch to the "RECORD" position, power is not supplied to the PCM Bus Conv and the Exp Redr Conv.	a) The AM and OWS Exp 1 "RECORD" lights do not come ON.	a)(1) Loss of recorded Exp 1 data	a) N/A	---

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relays, Latching, "OWS Exp 1 Record Relay #1" (K3 264) (52-79703-53) and "OWS Exp 1 Record Relay #2" (K3-265) (52-79703-53) (Continued)	M	b) Defective wire or terminal due to mechanical or thermal stress.	b) Loss of some recorded Exp 1 data.	b)(1) Crew switches the "LIGHTING STATUS" switch (on Panel 207) to the "TEST" position. The AM Exp 1 "RECORD" light "TESTS good. (2) Crew switches the AM Exp 1 switch to the "RECORD" position. The Exp 1 "RECORD" lights come ON.	b)(1) Ground requests that the crew use the AM Exp 1 switch to record Exp 1 data	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
				FIRST FAILURE			
Relays, Latching "OWS Exp 2 Record Relay #1" (K3-266) (52-79703-53) 3.7.19	M	a) Pole F of Relay K3-267 fails open in the latch position.	a) None	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
				SECOND FAILURE			
and "OWS Exp 2 Record Relay #2" (K3-267) (52-79703-53) 3.7.20	M	a) Pole F of Relay K3-266 fails open in the latch position.	a) When the crew switches the OWS "EXP 2" switch to the "RECORD" position, power is not supplied to the EXP 2 Rodr.	a) The AM & OWS Exp 2 "RECORD" lights do not come ON.	a) The Exp 2 Rodr tape motion monitor channel (normally K 510) indicates there is no tape motion.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. Crew can use the AM Exp 2 switch to record Exp 2 data.	b) (1) Crew switches the "LIGHTING STATUS" switch to the "TEST position. The AM EXP 2 "RECORD" light tests good. (2) Crew switches the AM Exp 2 switch to the "RECORD" lights come ON.	b) (1) Ground informs crew that the Exp 2 Rodr has no tape motion. (2) Ground requests that the crew switch the AM Exp 2 switch to the "RECORD" position.	b) IIIb	
				FIRST FAILURE			
	M	a) Pole E of one of the relays fails open in the latch position.	a) None	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
				SECOND FAILURE			
	M	a) Pole E of the other relay fails open in the latch position.	a) If ground has given the Data 2 RECORD command (S330), there is a loss of recorded Exp 2 data if the crew switches the OWS Exp 2 switch to the "RECORD" position.	a) None	a) Thru communications with crew or Recorded Voice, ground may learn that Exp 2 data was being recorded at a certain time. When Exp 2 Rodr is dumped, recorded Data 2 is received for that time period rather than recorded Exp 2 data.	a) N/A	---

(Continued on next page)

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
				SECOND FAILURE			
Relay, Latching, "OWS Exp 2 Record Relay #1" (K3-266) (52-79703-53) and "OWS Exp 2 Record Relay #2" (K3-267) (52-79703-53) (Continued)		b) Insulating film on contacts due to contamination	b) Loss of some recorded Exp 2 data. Crew or ground can restore Exp 2 recording capability.	b) None	b) (1) Ground requests that the crew use the AM Exp 2 switch for recording Exp 2 data, or (2) Ground gives Data 2 OFF command which permits recording from the AM Exp 2 switch.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
				FIRST FAILURE			
Relay, Latching, "OWS Exp 2 Record Relay #1" (K3-266) (52-79703-53)	M	a) Pole D of one of the relays fails open in the latch position.	a) None	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination	b) None	b) None	b) None	b) IIIb	
and							
				SECOND FAILURE			
"OWS Exp 2 Record Relay #2" (K3-267) (52-79703-53) (Continued)	M	a) Pole D of the other relay fails open in the latch position.	a) When the crew switches the OWS "EXP 2" switch to the "RECORD" position, power is not applied to the Exp Rcdr Conv. This results in a loss of power for the Exp 2 Rcdr.	a) The AM & OWS Exp 2 "RECORD" lights do not come ON.	a) (1) The Exp 2 Rcdr tape motion monitor channel (normally K510) indicates no tape motion. (2) The Exp Rcdr Bus voltage monitors (normally M520, M521 & M522) indicates zero volts. (3) Loss of recorded Exp 2 data.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) Loss of some recorded Exp 2 data. Crew of ground can restore Exp 2 recording capability.	b) (1) Crew switches the "LIGHTING STATUS" switch to the "TEST" position. The AM Exp 2 "RECORD" light tests good. (2) Crew switches the AM Exp 2 switch to the "RECORD" position. The Exp 2 "RECORD" lights come ON.	b) (1) Ground requests that the crew use the AM Exp 2 switch for recording Exp 2 data.	b) IIIb	
				FIRST FAILURE			
	M	a) Pole C of one of the relays fails open in the latch position.	a) None	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
				SECOND FAILURE			
	M	a) Pole C of the other relay fails open in the latch position.	a) When the crew switches the OWS "EXP 2" switch to the "RECORD" position, power is not applied to the PCM Bus Conv. This results in a loss of power to the PCM System.	a) None	a) Loss of recorded Exp 2 data.	a) N/A	---

* COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
				SECOND FAILURE			
Relay, Latching, "OWS Exp 2 Record Relay #1" (K3-266) (52-79703-53) and "OWS Exp 2 Record Relay #2" (K3-267) (52-79703-53) (Continued)		b) Insulating film on contacts due to contamination	b) Loss of some recorded Exp 2 data. Crew or ground can restore Exp 2 recording capability.	b) None	b) (1) Ground requests that the crew use the AM Exp 2 switch for recording Exp 2 data.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relays, Latching, "OWS Exp 2 Record Relay #1" (K3-266) (52-79703-53)	M	a) Pole B of one of the relays fails open in the latch position.	a) None	FIRST FAILURE a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
and "OWS Exp 2 Record Relay #2" (K3-267) (52-79703-53)	M	a) Pole B of the other relay fails open in the latch position.	a) When the crew switches the OWS "EXP 2" switch to the "RECORD" position, power is not supplied to the Exp 2 "RECORD" lights.	SECOND FAILURE a) The AM & OWS Exp 2 "RECORD" lights do not come ON.	a) The Exp 2 Rcdr tape motion monitor channel (normally K510) indicates there is tape motion.	a) N/A	---
(Continued)		b) Insulating film on contacts due to contamination.	b) None	b) (1) Crew switches the "LIGHTING STATUS" switch (on Panel 207) to the "TEST" position. The AM Exp 2 "RECORD" light tests good. (2) Crew switches the AM Exp 2 switch to the "RECORD" position. The Exp 2 "RECORD" lights come ON.	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
				FIRST FAILURE			
Relays, Latching, "OWS Exp 2 Record Relay #1" (K3-266) (52-79703-53) and "OWS Exp 2 Record Relay #2" (K3-267) (52-79703-53) (Continued)	M	a) Latch coil of one of the relays fails open.	a) None	a) None	a) None	a) N/A	---
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None	b) None	b) None	b) IIIb	
				SECOND FAILURE			
	M	a) Latch coil of the other relay fails open.	a) When the crew switches the OWS "EXP 2" switch to the "RECORD" position, power is not supplied to the PCM Bus Conv. and the Exp Rcdr Conv.	a) The AM & OWS Exp 2 "RECORD" lights do not come ON.	a) (1) Loss of recorded Exp 2 data.	a) N/A	---
		b) Defective wire or terminal due to mechanical or thermal stress.	b) Loss of some recorded Exp 2 data.	b) (1) Crew switches the "LIGHTING STATUS" switch (on Panel 207) to the "TEST position. The AM Exp 2 "RECORD" light "TESTS" good. (2) Crew switches the AM Exp 2 switch to the "RECORD" position. The Exp 2 "RECORD" lights come ON.	b) (1) Ground requests that the crew use the AM Exp 2 switch to to record Exp 2 data.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
				FIRST FAILURE			
Relays, Latching, "PCM Power Manual Control Relay #1" (K3-114) (52-79703-53) 3.8.6	L M S	a) Pole B of one of these relays fails open in the reset position.	a) None	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
				SECOND FAILURE			
and "PCM Power Manual Control Relay #3" (K3-53) (52-79703-79) 3.8.7	L M S	a) Pole B of the other relay fails open in the reset position.	a) Power is not supplied to the MDA and OWS -1 & -2 Signal Conditioners when the crew switches the "DATA" switch (on Panel 204) to the "RECORD" position, the ground commands Tape Recording - Data 2 RECORD (S330) or Backup R/T TM ON (S268), or the crew manually transmits R/T TM.	a) None	a) Ground observes a loss of data from the MDA and OWS -1 & -2 Signal Conditioners.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) Temporary loss of data from the affected Signal Conditioners.	b) None	b) (1) Ground uses the R/T TM ON command (11-2) or Tape Recording - Data RECORD command (S376) to restore power to the affected signal conditioners, or (2) Ground requests that the crew switch a Voice Record or an EXP 1 switch to the "RECORD" position to restore power to the affected signal conditioners.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
				FIRST FAILURE			
Relays, Latching, "PCM Power Manual Control Relay #1" (K3-114) (52-79703-53)	L M S	a) Pole B of one of the relays fails open in the latch position.	a) None	a) None	a) None	a) N/A	---
and		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
"PCM Power Manual Control Relay #3" (K3-53) (52-79703-79)	L M S	a) Pole B of the other relay fails open in the latch position.	a) Power is not removed from the MDA and OWS -1 & -2 Signal Conditioners when the crew switches the "DATA: switch (on Panel 204) to the "OFF" position, the ground commands Tape Recording - Data 2 OFF (S331) or Backup R/T TM OFF (S269) or the crew turns off R/T TM transmission.	SECOND FAILURE a) None	a) None	a) N/A	---
(Continued)		b) Insulating film on contacts due to contamination.	b) None, other than excessive power consumption.	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
				FIRST FAILURE			
Relays, Latching, "PCM Power CMD Control Relay #1" (K3-116) (52-79703-53)	L M S	a) Pole B of one of these relays fails open in the reset position.	a) None	a) None	a) None	a) N/A	---
3.8.9		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
				SECOND FAILURE			
and "PCM Power CMD Control Relay #3" (K3-54) (52-79703-79) 3.8.10	L M S	a) Pole B of the other relay fails open in the reset position.	a) Relays K3-54 and K3-116 cannot be cycled to the latch position. This results in power not being supplied to the MDA and OWS -1 and -2 when the ground commands R/T TM ON (11-2) or Tape Recording - Data RECORD (S376).	a) None	a) Ground observes a loss of data from the MDA and OWS -1 and -2 Signal Conditioners.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) Temporary loss of data from the affected signal conditioners.	b) None	b) (1) Ground uses the Back-up R/T TM ON command (S268) or Tape Recording - Data 2 RECORD command (S330) to restore power to the MDA and OWS -1 and -2 Signal Conditioners, or (2) Ground requests that the crew control the transmission of R/T TM or the recording of Data (subframe 1) to restore power to the MDA and OWS -1 and -2 Signal Conditioners.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
			FIRST FAILURE				
Relays, Latching, "EGM Power CMD Control Relay #1" (K3-116) (52-79703-53)		a) Pole B of one of these relays fails open in the latch position.	a) None	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
and							
			SECOND FAILURE				
"PCM Power CMD Control Relay #3 (K3-54) (52-79703-79)		a) Pole B of the other relay fails open in the latch position.	a) Relays K3-54 and K3-116 cannot be cycled to the reset position. Power is not removed from the MDA and OWS -1 and -2 Signal Conditioners when the ground commands R/T TM OFF (11-2) or Tape Recording Data OFF (S377), or the crew switches the Voice Record switch(es) OFF or the EXP 1 switch(es) OFF.	a) None	a) None	a) N/A	---
(Continued)		b) (1) Insulating film on contacts due to contamination.	b) None, other than excessive power consumption.	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
			FIRST FAILURE				
Relays, Latching, "Recorder #1 Bus A Power Relay #1" (K3-342) (52-79703-53) 3.9.09	L M S	a) Pole B of one of these relays fails open in the reset position.	a) None - redundancy on Pole B of the other relay.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
and							
			SECOND FAILURE				
"Recorder #1 Bus A Power Relay #2" (K3-343) (52-79703-61) 3.9.10	L M S	a) Pole B of the other relay fails open in the reset position.	a) Rcdr #1 cannot be powered from Bus A.	a) If Rcdr #1 is configured for Bus A power, the "RECORD" light(s) related to the Rcdr's data assignment do not come ON when the crew attempts to record data assigned to the Rcdr.	a) (1) Data or data and voice are not received when the ground dumps Rcdr #1. Only the carrier wave is received from the Xmtr(s). R/T TM indicates there is no tape motion. (2) When ground attempts to record data on Rcdr #1, R/T TM indicates no tape motion.	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None. Rcdr #1 is switched to Bus B power.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch to test the "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground reconfigures the Rcdrs so that Rcdr #1 is powered from Bus B or requests that the crew manually do the same.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relays, Latching "Recorder #1 Bus A Power Relay #1" (K3-342) (52-79703-53)			FIRST FAILURE				
	L M S	a) Pole B of one of these relays fails open in the latch position.	a) None - Redundancy on Pole B of the other relay.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
and							
"Recorder #1 Bus A Power Relay #2 (K3-343) (52-79703-61)			SECOND FAILURE				
	L M S	a) Pole B of the other relay fails open in the latch position.	a) Rcdr #1 will be powered up whenever Bus A is powered up.	a) (1) When crew commands Rcdr #1 OFF, sounds emitted from the Rcdr indicate it is still running, i.e. provided its bus is still powered-up. The "RECORD" indicator light(s) related to the function which has been switched OFF extinguish as expected. (2) If end-of-tape is reached, Rcdr #1 "STOP" light (on Panel 204) comes ON.	a) When ground commands Rcdr #1 OFF, R/T TM indicates it still has tape motion, i.e. provided its bus is still powered-up.	a) N/A	- - - - - - - - - -
(Continued)		b) Insulating film on contacts due to contamination.	b) Rcdr #1 may accumulate more operating time than desired but this can be kept within an acceptable amount with proper Bus/Rcdr assignments.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground uses the PCM Select B command (S274)so that Bus A is the Exp Rcdr Bus and then switches Rcdr #1 to be the Exp 1 (or Exp 2) Rcdr or requests that the crew manually select the desired Rcdr data assignments. This reduces the time that the Rcdr will be powered-up. NOTE: Ground cannot switch Exp 2 data to Rcdr #1 by using the DCS.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
			FIRST FAILURE				
Relays, Latching, "Recorder #1 Bus B Power Relay #1" (K3-345) (52-79703-53) 3.9.12	L M S	a) Pole B of one of these relays fails open in the reset position.	a) None - redundancy on Pole B of the other relay.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
and							
			SECOND FAILURE				
"Recorder #1 Bus B Power Relay #2" (K3-346) (52-79703-61) 3.9.13	L M S	a) Pole B of the other relay fails open in the reset position.	a) Rcdr #1 cannot be powered from Bus B.	a) If Rcdr #1 is configured for Bus B power, the "RECORD" light(s) related to the Rcdr's data assignment do not come ON when the crew attempts to record data assigned to the Rcdr.	a) (1) Data or data and voice are not received when the ground dumps Rcdr #1. Only the carrier wave is received from the Xmtr(s). R/T TM indicates there is no tape motion. (2) When ground attempts to record data on Rcdr #1, R/T TM indicates no tape motion.	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None. Rcdr #1 is switched to Bus A power.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew used the "LIGHTING STATUS" switch to test the "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground reconfigures the Rcdrs so that Rcdr #1 is powered from Bus A or requests that the crew manually do the same.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relays, Latching, "Recorder #1 Bus B Power Relay #1" (K3-345) (52-79703-61)			FIRST FAILURE				
	L M S	a) Pole B of one of these relays fails open in the latch position.	a) None - redundancy on Pole B of the other relay.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
and							
"Recorder #1 Bus B Power Relay #2" (K3-346) (52-79703-61)			SECOND FAILURE				
(Continued)	L M S	a) Pole B of the other relay fails open in the latch position.	a) Rcdr #1 will be powered-up whenever Bus B is powered-up.	a) (1) When crew commands Rcdr #1 OFF, sounds emitted from the Rcdr indicate it is still running, i.e. provided its bus is still powered-up. The "RECORD" indicator light(s) related to the function which has been switched OFF extinguish as expected. (2) If end-of-tape is reached, Rcdr #1 "STOP" light (on Panel 204) comes ON.)	a) When ground commands Rcdr #1 OFF, R/T TM indicates it still has tape motion, i.e. provided its bus is still powered-up.	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) Rcdr #1 may accumulate more operating time than desired but this can be kept within an acceptable amount with proper Bus/Rcdr assignments.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground uses the PGM Bus Select A command (S275) so that Bus B is the Exp Rcdr Bus and then switches Rcdr #1 to be the Exp 1 (or Exp 2) Rcdr or requests that the crew manually select the desired Rcdr data assignments. This reduces the time that the Rcdr will be powered-up. NOTE: Ground cannot switch Exp 2 data to Rcdr #1 by using the DCS.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relays, Latching, "Recorder #2 Bus B Power Relay #1" (K3-353) (52-79703-53) 3.9.15			FIRST FAILURE				
	L M S	a) Pole B of one of these relays fails open in the reset position.	a) None - redundancy on Pole B of the other relay.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
and							
"Recorder #2 Bus B Power Relay #2" (K3-354) (52-79703-61) 3.9.16			SECOND FAILURE				
	L M S	a) Pole B of the other relay fails open in the reset position.	a) Rcdr #2 cannot be powered from Bus B.	a) If Rcdr #2 is configures for Bus B power, the "RECORD" light(s) related to the Rcdr's data assignment do not come ON when the crew attempts to record data assigned to the Rcdr.	a) (1) Data or data and voice are not received when the ground dumps Rcdr #2. Only the carrier wave is received from the Xmtr(s). R/T TM indicates there is no tape motion. (2) When ground attempts to record data on Rcdr #2, R/T TM indicates no tape motion.	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None. Rcdr #2 is switched to Bus A power.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch to test the "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground reconfigures the Rcdrs #2 is powered from Bus A or requests that the crew manually do the same.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relays, Latching, "Recorder #2 Bus B Power Relay #1" (K3-353) (52-79703-53)			FIRST FAILURE				
	L M S	a) Pole B of one of these relays fails open in the latch position.	a) None - redundancy on Pole B of the other relay.	a) None	a) None	a) N/A	
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
and "Recorder #2 Bus B Power Relay #2" (K3-354) (52-79703-61)			SECOND FAILURE				
(Continued)	L M S	a) Pole B of the other relay fails open in the latch position.	a) Rcdr #2 will be powered-up whenever Bus B is powered-up.	a) (1) When crew commands Rcdr #2 OFF, sounds emitted from the Rcdr indicate it is still running, i.e. provided its bus is still powered-up. The "RECORD" indicator light(s) related to the function which has been switched OFF extinguish as expected. (2) If end-of-tape is reached, Rcdr #2 "STOP" light (on Panel 204) comes ON.	a) When ground commands Rcdr #2 OFF, R/T TM indicates it still has tape motion, i.e. provided its bus is still powered-up.	a) N/A	
		b) Insulating film on contacts due to contamination.	b) Rcdr #2 may accumulate more operating time than desired but this can be kept within an acceptable amount with proper Bus/Rcdr assignments.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground uses the PGM Bus Select A command (S275) so that Bus B is the Exp Rcdr Bus and then switches Rcdr #2 to be the Exp 1 (or Exp 2) Rcdr or requests that the crew manually select the desired Rcdr data assignments. This reduces the time that the Rcdr will be powered-up.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relays, Latching, "Recorder #2 Bus A Power Relay #1" (K3-348) (52-79703-53) 3.9.20			FIRST FAILURE				
	L M S	a) Pole B of one of these relays fails open in the reset position.	a) None - redundancy on Pole B of the other relay.	a) None	a) None	a) N/A	----------
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
and							
"Recorder #2 Bus A Power Relay #2" (K3-349) (52-79703-61) 3.9.21			SECOND FAILURE				
	L M S	a) Pole B of the other relay fails open in the reset position.	a) Rcdr #2 cannot be powered from Bus A.	a) If Rcdr #2 is configured for Bus A power, the "RECORD" light(s) related to the Rcdr's data assignment do not come ON when the crew attempts to record data assigned to the Rcdr.	a) (1) Data or data and voice are not received when the ground dumps Rcdr #2. Only the carrier wave is received from the Xmtr(s). R/T TM indicates there is no tape motion. (2) When ground attempts to record data on Rcdr #2, R/T TM indicates no tape motion.	a) N/A	----------
		b) Insulating film on contacts due to contamination.	b) None. Rcdr #2 is switched to Bus B power.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch to test the "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground reconfigures the Rcdrs so that Rcdr #2 is powered from Bus B or requests that the crew manually do the same.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relays, Latching, "Recorder #2 Bus A Power Relay #1" (K3-348) (52-79703-53)			F I R S T	F A I L U R E			
	L M S	a) Pole B of one of these relays fails open in the latch position.	a) None - redundancy on Pole B of the other relay.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
and							
"Recorder #2 Bus A Power Relay #2" (K3-349) (52-79703-61)			S E C O N D	F A I L U R E			
(Continued)	L M S	a) Pole B of the other relay fails open in the latch position.	a) Rcdr #2 will be powered-up whenever Bus A is powered-up.	a) (1) When crew commands Rcdr #2 OFF, sounds emitted from the Rcdr indicate it is still running, i.e. provided its bus is still powered-up. The "RECORD" indicator light(s) related to the function which has been switched OFF extinguish as expected. (2) If end-of-tape is reached, Rcdr #2 "STOP" light (on Panel 204) comes ON.	a) When ground commands Rcdr #2 OFF, R/T TM indicates it still has tape motion, i.e. provided its bus is still powered-up.	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) Rcdr #2 may accumulate more operating time than desired but this can be kept within an acceptable amount with proper Bus/Rcdr assignments.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground uses the PCM Bus Select B command (S274) so that Bus A is the Exp Rcdr Bus and then switches Rcdr #2 to be the Exp 1 (or Exp 2) Rcdr or requests that the crew manually select the desired Rcdr data assignments. This reduces the time that the Rcdr will be powered-up.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relays, Latching, "Recorder #3 Bus B Power Relay #1" (K3-361) (52-79703-53) 3.9.25			F I R S T F A I L U R E				
	L M S	a) Pole B of one of these relays fails open in the reset position.	a) None - redundancy on Pole B of the other relay.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
and "Recorder #3 Bus B Power Relay #2" (K3-362) (52-79703-61) 3.9.26			S E C O N D F A I L U R E				
	L M S	a) Pole B of the other relay fails open in the reset position.	a) Rcdr #3 cannot be powered from Bus B.	a) If Rcdr #3 is configures for Bus B power, the "RECORD" light(s) related to the Rcdr's data assignment do not come ON when the crew attempts to record data assigned to the Rcdr.	a) (1) Data or data and voice are not received when the ground dumps Rcdr #3. Only the carrier wave is received from the Xmtr(s). R/T TM indicates there is no tape motion. (2) When ground attempts to record data on Rcdr #3, R/T TM indicates no tape motion.	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None. Rcdr #3 is switched to Bus A power.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch to test the "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground reconfigures the Rcdrs so that Rcdr #3 is powered from Bus A or requests that the crew manually do the same.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relays, Latching, "Recorder #3 Bus B Power Relay #1" (K3-361) (52-79703-53)			FIRST FAILURE				
	L M S	a) Pole B of one of these relays fails open in the latch position.	a) None - redundancy on Pole B of the other relay.	a) None	a) None	a) N/A	- - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
and "Recorder #3 Bus B Power Relay #2" (K3-362) (52-79703-61) (Continued)			SECOND FAILURE				
	L M S	a) Pole B of the other relays fails open in the latch position.	a) Rcdr #3 will be powered-up whenever Bus B is powered-up.	a) (1) When crew commands Rcdr #3 OFF, sounds emitted from the Rcdr indicate it is still running, i.e. provided its bus is still powered-up. The "RECORD" indicator light(s) related to the function which has been switched OFF extinguish as expected. (2) If end-of-tape is reached, Rcdr #3 "STOP" light (on Panel 204) comes ON.	a) When ground commands Rcdr #3 OFF, R/T TM indicates it still has tape motion, i.e. provided its bus is still powered-up.	a) N/A	- - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) Rcdr #3 may accumulate more operating time than desired but this can be kept within an acceptable amount with proper Bus/Rcdr assignments.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test "RECORD" lights on Panel 204. (3) Crew informs ground of the anomaly.	b) Ground uses the PGM Bus Select A command (S275) so that Bus B is the Exp Rcdr Bus and then switches Rcdr #3 to be the Exp 1 (or Exp 2) Rcdr or requests that the crew manually select the desired Rcdr data assignments. This reduces the time that the Rcdr will be powered-up.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relays, Latching, "Recorder #3 Bus A Power Relay #1" (K3-358) (52-79703-53) 3.9.28			FIRST FAILURE				
	L M S	a) Pole B of one of these relays fails open in the reset position.	a) None - redundancy on Pole B of the other relay.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
and "Recorder #3 Bus A Power Relay #2" (K3-359) (52-79703-61) 3.9.29			SECOND FAILURE				
	L M S	a) Pole B of the other relay fails open in the reset position.	b) Rcdr #3 cannot be powered from Bus A.	a) If Rcdr #3 is configured for Bus A power, the "RECORD" light(s) related to the Rcdr's data assignment do not come ON when the crew attemps to record data assigned to the Rcdr.	a) (1) Data or data and voice are not received when the ground dumps Rcdr #3. Only the carrier wave is received from the Xmtr(s). R/T TM indicates there is no tape motion. (2) When ground attempts to record data on Rcdr #3, R/T TM indicates no tape motion.	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None. Rcdr #3 is switched to Bus B power.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch to test the "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) Ground reconfigures the Rcdrs so that Rcdr #3 is powered from Bus B or requests that the crew manually do the same.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relays, Latching "Recorder #3 Bus A Power Relay #1" (K3-358) (52-79703-53)			F I R S T F A I L U R E				
	L M S	a) Pole B of one of these relays fails open in the latch position.	a) None - redundancy on Pole B of the other relay.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
and "Recorder #3 Bus A Power Relay #2" (K3-359) (52-79703-61)			S E C O N D F A I L U R E				
(Continued)	L M S	a) Pole B of the other relay fails open in the latch position.	a) Rcdr #3 will be powered-up whenever Bus A is powered-up.	a) (1) When crew commands Rcdr #3 OFF, sounds emitted from the Rcdr indicate it is still running, i.e. provided-up. The "RECORD" indicator light(s) related to the function which has been switched OFF extinguish as expected. (2) If end-of-tape is reached, Rcdr #3 "STOP" light (on Panel 204) comes ON.	a) When ground commands Rcdr #3 OFF, R/T TM indicates it still has tape motion, i.e. provided its bus is still powered-up.	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) Rcdr #3 may accumulate more operating time than desired but this can be kept within an acceptable amount with proper Bus/Rcdr assignments.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch to test "RECORD" lights on Panel 204.	b) Ground uses the PGM Bus Select B command (S274) so that Bus A is the Exp Rcdr Bus and then switches Rcdr #3 to be the Exp 1 (or Exp 2) Rcdr or requests that the crew manually select the desired Rcdr data assignments. This reduces the time that the Rcdr will be powered-up.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
			F I R S T F A I L U R E				
Switch, Momentary "V O I C E" (on Panel 316) (52-79705-137)	M	a) Contact set (2,3) or (5,6) fails open in the "RECORD" position.	a) None - Redundancy is provided by the other contact set.	a) None	a) None	a) N/A	- - - - -
3.5.24		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
			S E C O N D F A I L U R E				
	M	a) The other contact set (5,6) or (2, 3) fails open in the "RECORD" position.	a) Power is not supplied to the PCM Bus Conv, the MDA signal Conditioner, the OWS-1 and -2 Signal Conditioners, the PCM Equipment and the Data Rcdr.	a) The Voice Record lights do not come ON.	a) None	a) N/A	- - - - -
		b) Insulating film on contacts due to contamination.	b) None. Voice can be recorded by using the other Voice Record switches on the SIA's.	b) (1) Crew switches one of the other Voice Record switches to the "RECORD" position. The related Voice Record indicator lights come ON. (2) Crew informs ground of the anomaly.	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
			FIRST FAILURE				
Switch, Momentary "VOICE" (on Panel 316) (52-79705-137)	M	a) Contact set (5,4) fails open in the "OFF" position.	a) None - Redundancy is provided by contact set, (2,1).	a) None	a) None	a) N/A	- - - - -
Continued		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
			SECOND FAILURE				
	M	a) Contact set (2,1) fails open in the "OFF" position.	a) Power is not removed from the following equipment when the "VOICE" switch is cycled to the "OFF" position: o MDA Signal Conditioner. o OWS-1 and -2 Signal Conditioners. o The PCM Bus Converter (normally Conv #1) o The Data Rcdr (normally T/R #1). Rcdr continues to operate in the record mode. Recorder is not damaged if the end-of-tape is reached.	a) (1) The "RECORD" lights (green in the MDA, STS, Lock Compt., and OWS do not extinguish when the "VOICE" switch on Panel 316 is cycled to the "OFF" position. (2) If the end-of-tape is reached, the Data Rcdr "STOP" light (on Panel 204) comes ON.	a) If R/T TM is being received, the Tape Motion Monitor channel (normally K508) indicates "motion" for the Data Rcdr even though the Rcdr is supposed to be powered-down.	a) N/A	- - - - -
		b) Insulating film on contacts due to contamination.	b) None. Power can be removed from the above equipment by using the Voice Record switch on any of the SIA's to the "OFF" position.	b) Crew switches the Voice Record switch on any SIA to the "OFF" position.	b) Ground communicates with the crew to determine if they are recording Voice.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
			FIRST FAILURE				
Relays, Latching "Voice Record #2 Relay #1" (K3-201) (52-79703-53) 3.5.26 and "Voice Record #1 Relay #1" (K3-200) (52-79703-53) 3.5.25.	M	a) Pole C of one of these relays fails open in the latch position.	a) None - Redundancy provided on Pole C of the other relay.	a) None	a) None	a) N/A	- - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
			SECOND FAILURE				
	M	a) Pole C of the other relay fails open in the latch position.	a) Power is not supplied to the PCM Bus Conv when the crew switches one of the Voice Record switches to the "RECORD" position.	a) The Voice Record lights (green) in the MDA, STS, Lock Compt. and OWS do not come ON when the crew attempts to record voice.	a) None	a) N/A	- - - - -
		b) Insulating film on contacts due to contamination.	b) None. Power can be restored to the affected equipment.	b) (1) Crew switches the "TAPE RECORDING DATA" switch (on Panel 204) to the "RECORD" position. This restores power to the PCM Bus Conv. The Voice Record indicator lights then come ON. (2) In the OWS, crew can switch one of the Exp 1 or Exp 2 switches to the "RECORD" position when recording voice. This will supply power to the PCM Bus Conv. (3) Crew informs ground of the anomaly.	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
			FIRST FAILURE				
Relays, Latching, "Voice Record #2 Relay #1" (K3-201) (52-79703-53)	M	a) Pole D fails of Relay K3-201 fails open in the latch position.	a) None - Redundancy is provided by Pole D of Relay K3-200.	a) None	a) None	a) N/A	- - - - -
and		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
"Voice Record #1 Relay #1" (K3-200) (52-79703-53)			SECOND FAILURE				
(Continued)	M	a) Pole D of Relay K3-200 fails open in the latch position.	a) Power is not supplied to the Data Rcdr when the crew attempts to record voice.	a) The Voice Record lights (green) in the MDA, STS, Lock Compt. and OWS do not come ON when the crew attempts to record voice.	a) None	a) N/A	- - - - -
		b) Insulating film on contacts due to contamination.	b) None. Crew can still record voice on the Data Rcdr. Voice can also be recorded on the Experiment Rcdrs.	b) (1) Crew switches Voice Record switch "OFF", then switches "DATA" switch (on Panel 204) to the "RECORD" position. This powers up the data Rcdr. Crew then switches a Voice Record switch to the "Record" position. Voice Record indicator lights come ON. (2) Crew informs ground of anomaly.	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
			FIRST FAILURE				
Relays, Latching, "Voice Record #2 Relay #1" (K3-201) (52-79703-53)	M	a) Pole E of one of these relays fails open in the latch position.	a) None - Redundancy is provided by Pole E of the other relay.	a) None	a) None	a) N/A	- - - - -
and		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
"Voice Record #1 Relay #1" (K3-200) (52-79703-53)			SECOND FAILURE				
(Continued)	M	a) Pole E of the other relay fails open in the latch position.	a) Power is not supplied to the following equipment when the crew switches a Voice Record Switch to the "RECORD" positions: o MDA Signal Conditipner. o OWS -1 and -2 Signal Conditioners.	a) None	a) When the ground dumps the Data Recorder, Data is not received from the affected signal conditioners.	a) N/A	- - - - -
		b) Insulating film on contacts due to contamination.	b) None. Power to affected signal conditioners can be restored by several means.	b) None	b) (1) Ground informs crew of the anomaly. (2) Ground requests that the crew use the "DATA" switch or one of the Exp Record switches when recording voice. This restores power to the affected signal conditions.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
			FIRST FAILURE				
Relays, Latching, "Voice Record #2 Relay #1" (K3-201) (52-79703-53)	M	a) Latch coil of Relay K3-201 fails open.	a) None - Redundancy is provided by Relay K3-200.	a) None	a) None	a) N/A	- - - - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None	b) None	b) None	b) IIIb	
and "Voice Record #1 Relay #1" (K3-200) (52-79703-53)			SECOND FAILURE				
(Continued)	M	a) Latch coil of Relay K3-200 fails open.	a) If the PCM Conv is powered-down, power is not supplied to the following equipment when the crew switches a Voice Record switch to the "RECORD" position: o PCM Bus Conv o Data Rcdr o MDA and OWS Signal Conditioners.	a) The Voice Record Lights (green) in the MDA, STS, Lock Compt. and OWS do not come ON when the crew attempts to record voice.	a) None	a) N/A	- - - - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. Power can be restored to the affected equipment.	b) (1) Crew switches the "TAPE RECORDING DATA" switch (on Panel 204) to the "RECORD" position. This restores power to the affected equipment. The Voice Record indicator lights will then come ON. (2) In the OWS, crew can switch one of the Exp 1 or Exp 2 switches to the "RECORD" position when recording voice. This will also restore power to the affected equipment. (3) Crew informs ground of the anomaly.	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
			FIRST FAILURE				
Relay, Latching, "Programmer Select Mode Control Relay #1" (K3-154) (52-79703-61) 3.6.27	M	a) Pole C or Pole D fails open in the reset position.	a) None - Redundancy is provided by the other of these two poles.	a) None	a) None	a) N/A	- - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
			SECOND FAILURE				
	M	a) The other of these two poles fails open in the reset position.	a) There is a loss of -24 VDC power to the Pgmr. This results in a loss of TM.	a) None	a) Loss of R/T TM data and recorded Subframes 1, 2, 3 and 4. Recorded voice is not affected.	a) N/A	- - - - -
		b) Insulating film on contacts due to contamination.	b) Temporary loss of TM data. Crew can restore power to the Programmer.	b) None	b) Ground requests that the crew manually select the desired Programmer. This restores power for TM data.	b) IIIb	
			FIRST FAILURE				
	L S	a) Pole C or Pole D fails open in the reset position.	a) None - Redundancy is provided by the other of these two poles.	a) None	a) None	a) N/A	- - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
			SECOND FAILURE				
	L S	a) The other of these two poles fails open in the reset position.	a) There is a loff of -24 VDC power to the Pgmr. This results in a loss of TM. Power cannot be restored.	a) None	a) Loss of R/T TM data and recorded Subframes 1 and 4.	a) N/A	- - - - -
		b) Insulating film on contacts due to contamination.	b) TM cannot be restored. Mission will likely be terminated since vehicle integrity for crew visitation cannot be verified.	b) None	b) None	b) II	

* COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
			F I R S T F A I L U R E				
Relays, Latching, "Voice Record #1 Relay #2" (K3-198) (52-79703-61) 3.5.04 and "Voice Record #2 Relay #2" (K3-199) (52-79703-61) 3.5.05	M	a) Pole F of Relay K3-199 fails open in the latch position.	a) None - Redundancy is provided on Pole F of Relay K3-198.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
			S E C O N D F A I L U R E				
	M	a) Pole F of Relay K3-198 fails open in the latch position.	a) Loss of voice input signal to Channel B of Rcdr #1.	a) None	a) Voice is not received from Rcdr #1 when it is dumped. Only data is received from Rcdr #1.	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) (1) Ground informs crew of the anomaly. (2) Ground requests that the crew manually configure the Rcdrs so that Rcdr #1 is the Exp 2 Rcdr since voice which is recorded on the Exp 2 Rcdr is seldom used.	b) IIIb	
			F I R S T F A I L U R E				
	M	a) Pole E of Relay K3-199 fails open in the latch position.	a) None - Redundancy is provided on Pole E of Relay K3-198.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
			SECOND FAILURE				
Relays, Latching, "Voice Record #1 Relay #2" (K3-198) (52-79703-61) 3.5.04 and "Voice Record #2 Relay #2" (K3-199) (52-79703-61) 3.5.05 (Continued)	M	a) Pole E of Relay K3-198 fails open in the latch position.	a) Loss of voice input signal to Channel B of Rcdr #2.	a) None	a) Voice is not received from Rcdr #2 when it is dumped. Only data is received from Rcdr #2.	a) N/A	- - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) (1) Ground informs crew of the anomaly. (2) Ground configures the Rcdrs so that Rcdr #2 is the Exp 2 Rcdr or ground requests that the crew manually do the same.	b) IIIb	
			FIRST FAILURE				
		a) Pole D of Relay K3-199 fails open in the latch position.	a) None - Redundancy is provided on Pole E of Relay K3-198.	a) None	a) None	a) N/A	- - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
			SECOND FAILURE				
	M	a) Pole D of Relay K3-198 fails open in the latch position.	a) Loss of voice input signal to Channel B of Rcdr #3.	a) None	a) Voice is not received from Rcdr #3 when it is dumped. Only data is received from Rcdr #3.	a) N/A	
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) (1) Ground informs crew of the anomaly. (2) Ground configures the Rcdrs so that Rcdr #3 is the Exp 2 Rcdr or ground requests that the crew manually do the same.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
			F I R S T F A I L U R E				
Relays, Latching, "Voice Record #1 Relay #2" (K3-198) (52-79703-61) (3.5.04)	M	a) Reset coil of Relay K3-199 fails open.	a) None - Redundancy is provided by Relay K3-198.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
and			S E C O N D F A I L U R E				
"Voice Record #2 Relay #2" (K3-199) (52-79703-61) (3.5.05) (Continued)		a) Reset coil of Relay K3-198 fails open.	a) Loss of voice input signal to Channel B of all three Rcdrs.	a) None	a) Loss of recorded voice from each of the Rcdrs.	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) Loss of recorded voice. Recorded data is not affected, nor is R/T voice or TM.	b) None	b) Ground informs crew of the anomaly and directs them in trouble-shooting the problem.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
			F I R S T F A I L U R E				
Circuit Breaker, Magnetic, "Suit Umbilical Sys 1 EVA CCU - 1" (3-13) (52-79721-320) (5.4 amps) (on Panel 202 3.20.01	M	a) One of these two breakers fails open before break current is exceeded.	a) None - Redundancy is provided by the other breaker.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Internal defect, coil short to ground.	b) None	b) None	b) None	b) IIIb	
and			S E C O N D F A I L U R E				
Circuit Breaker, Magnetic, "Suit Umbilical System 1 EVA CCU - 2" (3-14) (52-79721-320) (5.4 amps) (on Panel 202) 3.20.02	M	a) The other circuit breaker fails open before break current is exceeded.	a) There is a loss of power to the PCU of crewman #1 during EVA operations.	a) (1) The panel lites on crewman #1 PCU go out. (2) There is a loss of communications with the other crewmen and with the ground.	a) (1) There is a loss of communications with crewman #1. (2) There is a loss of TM data from crewman #1.	a) N/A	- - - - - - - - - -
		b) Internal defect, coil short to ground.	b) None - Crewmen 1 and 2 can interchange Umbilical Systems which they use.	b) (1) Affected crewman uses hand signals to inform other crewmen of the anomaly. (2) Remaining crewmen inform ground of the anomaly and perform Umbilical System switching as directed by the ground.	b) Ground directs crewman nearest Panel 317 in the procedure for switching crewman #2 to "SUIT UMB SYS 1" and crewman #1 to "SUIT UMB SYS 2".	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
			F I R S T F A I L U R E				
Circuit Breaker, Magnetic, "Suit Umbilical Sys 2 EVA CCU - 1" (3-113) (52-79721-320) (5.4 amps) (on Panel 202) 3.20.03	M	a) One of these two breakers fails open before break current is exceeded.	a) None - Redundancy is provided by the other breaker.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Internal defect, coil short to ground.	b) None	b) None	b) None	b) IIIb	
and			S E C O N D F A I L U R E				
Circuit Breaker, Magnetic, "Suit Umbilical System 2 EVA CCU - 2" (3-112) (52-79721-320) (5.4 amps) (on Panel 202) 3.20.04	M	a) The other circuit breaker fails open before break current is exceeded.	a) There is a lossof power to the PCU of crewman #2 during EVA operations.	a) (1) The panel lites on crewman #2's PCU go out. (2) There is a loss of communications with the other crewmen and with the ground.	a) (1) Ther is a loss of communications with crewman #2. (2) Tere is a loss of TM data from crewman #2.	a) N/A	- - - - - - - - - -
		b) Internal defect coil short to ground.	b) None - Crewmen 1 and 2 can interchange Umbilical Systems which they use.	b) (1) Affected crewman uses hand signals to inform other crewman of the anomaly. (2) Remaining crewmen inform ground of the anomaly and perform Umbilical System switching as directed by the gound.	b) Ground directs crewman nearest Panel 323 in the procedure for switching crewman #2 to "SUIT UMB SYS 1" and crewman #1 to "SUIT UMB SYS 2".	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
			FIRST FAILURE				
Switch, Toggle "Suit Umb Sys 1 LSU Power ON/OFF (52-79705-129) (located on Panel 317) 3.20.07	M	a) Contact set (2,3) or (5,6) fails open in the "ON" position.	a) None - Redundancy is provided by the other contact set of this switch.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
			SECOND FAILURE				
	M	a) The other contact set fails open in the "ON" position.	a) There is a loss of power to the PCU of crewman #1 during EVA operations.	a) (1) The panel lites on crewman #1's PCU go out. (2) There is a loss of communications with the other crewmen and with the ground.	a) (1) There is a loss of communications with crewman #1. (2) There is a loss of TM data from crewman #1.	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None - Crewmen 1 and 2 can interchange Umbilical Systems which they use.	b) (1) Affected crewman uses hand signals to inform other crewmen of the anomaly. (2) Remaining crewmen inform ground of the anomaly and perform Umbilical System switching as directed by the ground.	b) Ground directs crewman nearest Panel 317 in the procedure for switching crewman #1 to "SUIT UMB SYS 2" and crewman #2 to "SUIT UMB SYS 1".	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
			FIRST FAILURE				
Switch, Toggle, "Suit Umb Sys 2 LSU Power ON/OFF" (52-79705-129) (located on Panel 323) 3.20.10	M	a) Contact set (2,3) or (5,6) fails open in the "ON" position.	a) None - Redundancy is provided by the other contact set of this switch.	a) None	a) None	a) N/A	----------
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
			SECOND FAILURE				
	M	a) The other contact set fails open in the "ON" position.	a) There is a loss of power to the PCU of crewman #2 during EVA operations.	a) (1) The panel lites on crewman #2's PCU go out. (2) There is a loss of communications with the other crewmen and with the ground.	a) (1) There is a loss of communications with crewman #2. (2) There is a loss of TM data from crewman #2.	a) N/A	----------
		b) Insulating film on contacts due to contemination.	b) None - Crewmen 1 and 2 can interchange Umbilical Systems which they use.	b) (1) Affected crewman uses hand signals to inform other crewmen of the anomaly. (2) Remaining crewmen inform ground of the anomaly and perform Umbilical System switching as directed by the ground.	b) Ground directs crewman nearest Panel 323 in the procedure for switching crewman #2 to "SUIT UMB SYS 1" and crewman #1 to "SUIT UMB SYS 2".	b) IIIb	